THE DOCK & HARBOUR AUTHORITY

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Editorial Comments.

EXTENSIONS AT MARSEILLES.

The shipping and passenger traffic of Marseilles even before the War showed evidence of an increase in volume which called for an expansion of the port area and an increase in docking and handling facilities. An examination of the geographical position of this great port with its intimate relationship to world commerce generally and the French Colonial Empire in particular reveals the causes of this growth in trade. Standing on the expansive debouchement of the Rhône inland waterway rising as far north as Dijon, east of the Côte d'Or Range, it is located in convenient adjacency to Africa and more especially the coastal colonies of Algeria and Morocco.

In the wider aspect of its position on the Mediterranean, Marseilles has as it were several days start of the Port of London in the trade of the Near and Far East, not neglecting its immunity from the navigational obstacles presented by the stormy seas of the Atlantic and Biscay which lie in the way of vessels from the English Port bound for the Mediterranean, Near East and beyond. In this respect, Marseilles has also an advantage over Bordeaux on the west coast of France which applies in less but still strong measure to the Spanish and Portuguese ports of Santander, Oporto, Lisbon and even that near neighbour, Barcelona. In both coastal trade around the Mediterranean, with Italy, the Adriatic countries to a small degree, Greece, the Black Sea Ports, Egypt and Constantinople, the advantage of position still holds. In the larger voyages via the Suez Canal to India and the Far East, the proportionate advantage of time is not so great but still enough to encourage the use of Marseilles with rail and river forwarding to the northern countries of Europe.

It is axiomatic that maritime shipment is cheaper than land transport but the inducement to send goods by the overland route via Marseilles is no small one particularly having regard to the fact that French rail charges are relatively low and encouraging to foreign merchants whose transactions are effected in currency of high international value. These basic considerations explain the degree of growth which has warranted the present extensions at Marseilles not overlooking a passenger traffic of close on 800,000 a year, half of which is between France and the North African Colonies.

As long ago as 1913 the problem of increasing port facilities was being attacked on far reaching lines in the scheme which estimated future requirements until 1932 on the assumption of a three per cent. annual increase in traffic. Events have proved the actuarial basis to have been a conservative one, the war suspended the work of extension, and the passage of years brings an improved port-planning technique to the service of present needs and the estimate of future requirements.

In the latter sense it must be remembered that Marseilles has not only a great import traffic but also a formidable export business which in conjunction with local industry supports a population of 660,000 people in the capital of the Bouches-du Rhône Department. These exports are chiefly wine, silk, woollens, cotton and fruit. The flow of these and other commodities will be further accelerated by the Marseilles-Rhône canal, through the subterranean Rove Tunnel opened by President Doumergue on April 25th, 1927. By piercing the neck of mountainous land which forms the south-eastern boundary of the Etang de Berre Lake, north-west of France's great port of the south, this Tunnel with the Port de Bouc at its western end, has linked Marseilles with the vast inland waterway systems of France, the Netherlands and Central Europe. It would be presumption to attempt to pay adequate tribute to this masterpiece of French engineering genius. Those further interested in the history, finance and technical aspects of this work should turn to Senator Leon Brun's book, "Les Annexes Portuaires de Marseille et Le Canal de Marseille au Rhône," published at Marseilles by "Le Semaphore." That volume conveyes an adequate conception of the great work at Marseilles and the magnitude of the plans for its extension. Until those conjunctive details are mastered it is well nigh impossible to appreciate the full significance of the improvements now in progress.

Suffice to say at this stage that in 1924 that enlightened body, the Marseilles Chamber of Commerce which is the Port Authority went into the issues of docking and wharfage facilities. The result in that direction is the Revised Extension Scheme planned by Monsieur Sainflon, the fundamental principle of which is an increase in docks and basins as contemplated in pre-war days but with the sound advantage of less extensive increase in water area than hitherto proposed but a greater ratio of wharves associated with simpler and bolder sea-works.

Passengers through Marseilles in 1926 totalled 781,724, vessels 14,357 with a metric net tonnage of 24,199,915 and 7,310,869 tons of merchandise handled. The latter figure shows a fall against 8,938,652 in 1913, although the net tonnage of vessels has increased from 21,090,820 in that year when vessels entering and leaving totalled 17,278. The number has since fallen but the tonnage is greater and the present scheme meets that position by deeper and longer berths than those proposed before the war. Passenger traffic has increased by 38 per cent. over the 1913 figure of 566,165.

IMPROVEMENTS AT SWANSEA.

Before the chief South Wales ports were amalgamated under one administration by the Railways Act of 1921, the Swansea Docks were owned by the Swansea Harbour Trust. Their acquisition by the Great Western Railway Company in 1923 went a long way towards mitigating the problem of plant replacement previously due to the difficulty in raising capital. What has since been done in the direction of general improvement is detailed in the recent publication "New Works and Facilities at South Wales Ports."

The chief exports are anthracite and tinplate and the character of the trade has been borne in mind to a special degree in designing new accommmodation for cargo and in furnishing further handling machinery. Two large sheds on the north and south sides of King's Dock built for the Government during the war were acquired and three 3-ton electric luffing jib cranes erected adjacent to each. Cargoes of zinc concentrates, iron ore and manganese are now handled at the 1,600 ft. quay alongside No. 1 Shed where three 5-ton hydraulic cranes have been installed. At the west end three 3-ton electric luffing cranes have been put down opposite A and B storehouses whilst three more hydraulic cranes are to be added at Prince of Wales Dock near No. 55 Shed.

A line was built through the centre of No. 1 Shed, King's Dock, thereby reducing wagon journeys and unloading under cover. Damage to tinplates and blackplates, articles at once heavy and yet requiring careful shipment has been reduced by installing forty special conveyors on the toast-rack principle, the plates, however, being laid horizontally with security bar above. Runabout electric cranes and trollies have also been provided in the warehouses.

The mole at the east end of King's Dock is to be equipped as a cargo berth by building a two-storey shed, 352 ft. by 75 ft. wide with two 4-ton gantry cranes on the ground floor and four semi-portal 3-ton electric luffing cranes at each side of the quay.

As at Cardiff telephonic arrangements have been improved throughout the dock area, by renewing and enlarging the private branch exchange. Control systems for both Traffic and Marine Sections have been instituted. The lock gates at King's Dock have been overhauled and a spare set provided for emergency use. There are now nine coaling appliances for large 20-ton wagons against six in 1923, comprising six at King's Dock and three at Prince of Wales Dock.

Accommodation for the shipment of many classes of anthracite requiring localisation of truckloads according to grade was inadequate in 1923 and six new reception sidings with shunting hump, sorting and storage lines have been completed at the Burrows east of the docks. Further lines for empty wagons are to be laid at Briton Ferry Road. General re-laying and re-modelling of dock lines has also been effected whilst road approaches have been improved particularly at the entrance to the Prince of Wales Dock.

Extensive repairs are in progress at the Eastern Breakwater, and the Bull Nose or western side of the entrance to King's Dock Lock and at the southern approach oil bunkering jetty. Work on renewing the drawbridge over the North Dock entrance has been completed. Electricity for power and lighting is now obtained from Swansea Corporation; plant and buildings have been adapted to this end throughout the Docks.

CHICAGO HARBOUR PLAN.

Chicago occupies so high a place of importance, not only in the industrial and commercial life of the United States, but in relation to world commerce generally that adequate harbour facilities would naturally be regarded as a *sine qua non* of a city so closely located to the south-western shore of Lake Michigan. In the past however, facilities in this respect have not been of pre-eminent character largely because of the unpropitious topography of such natural waterways that lay in the vicinity. There is nothing remotely akin to the magnificent river approach of such inland European ports as London, Paris or Basle, having special regard always to the fact that Chicago stands almost at the heart of a continent. Instead of a great river at its back door it has the southernmost of the Great Lakes. The only natural outlet of Lake Michigan, and a very limited one, is the Chicago River. This does not form anything like a valuable inland link with other areas of population and trade as it is quite short and runs only a few miles north, parallel to the coast and not far away.

Deficiencies in facilities for water transport have from time to time been reduced by the various canal systems which have been constructed. Those in the immediate neighbourhood comprise the North Shore Canal running south from Wilmette Harbour to meet the Chicago River almost midway on its southerly journey to the sea. From the same junction the more vital and longer Chicago Drainage Canal runs inland in a south-westerly direction later to link with the Desplaines River which rises outside Illinois in the State of Wisconsin to the north. Proceeding south along the coast of Lake Michigan the next harbour available beyond Chicago is Calumet. Some distance beyond there is a whole group of ports at the southern end of Lake Michigan comprising Indiana Harbour with canal, Bluffington and Gary Harbour with Michigan City still further beyond on the east. Chicago and Calumet Harbours are close by, correlated in the Chicago Harbour Plan illustrated in this month's Supplement.

This scheme, the fruits of an investigation by the Committee on Chicago Harbour and Port Survey which the Commercial Club of Chicago instituted with the approbation of the City Council, aims at meeting the demands of commerce and aesthetic requirements by careful planning made long in advance with a view to a well arranged completed system.

Those faced from time to time with problems of port development are all too well aware that these have to be prosecuted in a limited and narrow way, not so much through financial considerations as by the handicaps imposed by an existing area which has spread out piecemeal until it has become an illogical and inconvenient whole. The very haphazard character of the locations of premises housing auxiliary services makes it at once ugly and expensive to work. A long programme for ten or fifteen years' construction may appear forbidding at the outset by reason of the magnitude of the cost but in the long run where the trade of the port is progressive it is easy to maintain and administer whilst avoiding the host of transportation and other problems which inevitably follow an increased and moving trade which has to be handled amid badly grouped premises.

An examination of the more recent history of Chicago shows that the modern city has been built along systematic lines laid down by the Chicago Plan Commission. The fruition of much work in this direction is regaded as an outstanding example of the "Chicago Spirit."

In 1910 an American artist, Mr. Daniel Burnham, painted a series of pictures visualising the future development of Chicago. By a propitious sequence of circumstances, practical genius for the application and prosecution of these ideals of beautiful city planning was forthcoming in the person of Mr. Charles Wacker who has done much towards beautifying Chicago.

Not for one moment must it be overlooked that Chicago is a great industrial centre with all that it implies. Nevertheless, the policy of intelligent planning for the future is a heartening assurance of a return to the true American tradition of early days, the highmindedness of Jefferson and the practical commonsense of Franklin.

No comprehensive harbour scheme was formulated at the inception of the Chicago City Plan, as at that time only five per cent. of the freight traffic of Chicago was done by water. Suggestions were, however, made which later proved of permanent value. When the original City Plan was formally announced, it was stated that it took into consideration the fact that the American City and Chicago pre-eminently is a centre of industry and traffic. Attention was therefore given to the betterment of commercial facilities; to methods of transportation for persons and goods; to removing the obstacles which prevent or obstruct circulation and to the increase of conveniences.

Since the earlier years of the present century the position has changed and the prospects of the Port of Chicago are much more encouraging. The Illinois Lakes-to-the-Gulf Waterway and the St. Lawrence Great Lakes Waterway have become practical politics. After the war the City of Chicago applied to the Federal Government for permission to construct a movable bridge across the river at La Salle Street; the War Department witheld consent, and asked the City of Chicago to appoint a Port Commission to study and report upon all matters pertaining to the water port of Chicago. This was done on December 3rd, 1924, and the permit for the La Salle bridge was then approved. This commission in order to determine the probable expense of an investigation, had a short preliminary report made by Major-General W. M. Black, late Chief Engineer of the United States Army. This showed that about $50,000 would be required to complete the survey. This amount could not be spared from the City funds, and the Commercial Club, with great public spirit raised the money and carried out the work. The investigations of this Committee on Chicago Harbour and Port Survey are detailed elsewhere in this issue.

LLOYD'S REGISTER OF SHIPPING.

At the special meeting on May 17th of the General Committee of Lloyd's Register of Shipping, the annual elections of chairmen took place for the year beginning 1st July, 1928.

Sir S. George Higgins, C.B.E., was elected chairman in succession to Sir Thomas J. Storey, K.B.E., who, in view of advancing years, has asked to be relieved of his duties at the end of June, but will retain his seat as a member of the General Committee of the Register. Sir Thomas has occupied the chair since December, 1925.

Sir George Higgins, who has been deputy-chairman and treasurer since December, 1925, took his seat on the General Committee of Lloyd's Register in 1922 ex-officio as chairman of the London General Shipowners' Society. He is chairman and managing director of Messrs. Wm. France, Fenwick and Co., Ltd., and is a director of the Denaby and Cadeby Main Collieries, Ltd. From 1917 to 1919 Sir George acted in an honorary capacity as Assistant Accountant-General at the Ministry of Shipping. He received the order of C.B.E. in 1918, and was created a Knight in 1919.

The General Committee have elected Mr. Arthur L. Sturge to succeed Sir George Higgins as deputy-chairman and treasurer. Mr. Sturge was elected to a seat on the General Committee of Lloyd's Register in July, 1917. He is an underwriter, and was chairman of Lloyd's in 1922 and 1923. In December, 1923, Mr. Sturge was awarded the Gold Medal for distinguished services to Lloyd's.

Mr. J. Howard Glover was re-elected to the office of chairman of the Sub-Committees of Classification, which he has held since 1923.

SHIPPING TRAFFIC AT HAMBURG.

A report received by the Department of Overseas Trade from His Majesty's Consul-General at Hamburg states that there was an increase of 80,000 tons in the total tonnage entered and a decline of 112,000 tons in the total tonnage cleared at the port during April, but the decline in the tonnage cleared with cargo was less than 30,000 tons. The figures for the four months ended April 30th are much in advance of 1927 or any previous year.

British shipping in April amounted to 222 vessels (442,517 tons) entered and 210 vessels (403,546 tons) cleared, compared with 215 vessels (435,000 tons) entered and 217 vessels (429,648 tons cleared) in March.

German tonnage in April amounted to 829,764 tons entered (720,480 tons in March), and 767,714 tons cleared (752,28[illegible] tons in March).

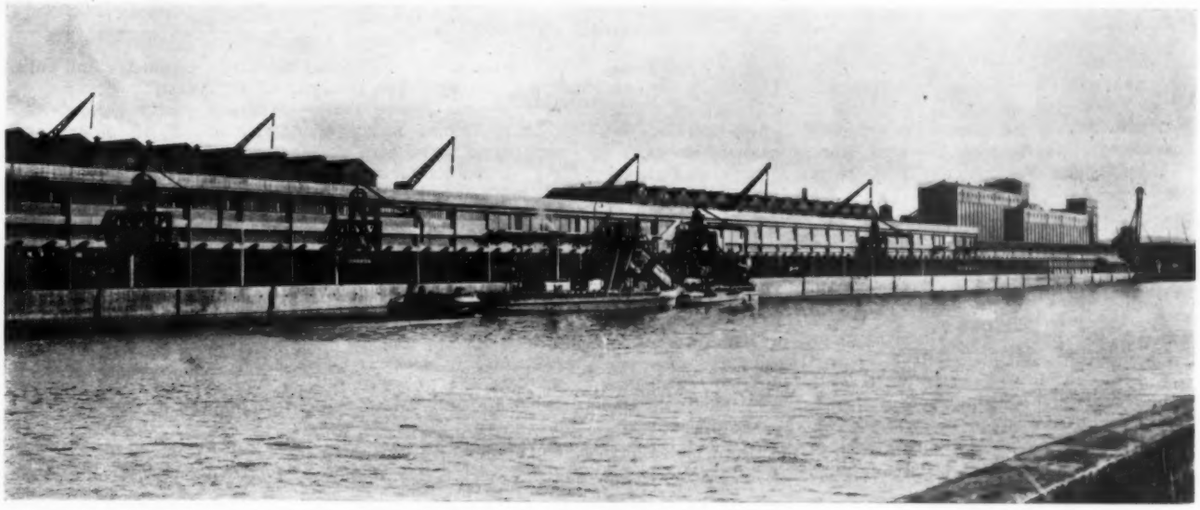
MORE NEW SHIPS.

Southampton is naturally interested in the announcement made at the annual shareholders' meeting of the Canadian Pacific Railway Company, that the Company are planning the construction of two new vessels this year, one for the Atlantic service and one for the Pacific passenger trade. It is understood that the vessel projected for the Atlantic route will be placed on the Southampton service. It will probably be a vessel of about 24,000 tons, and will be of the well-known Empress type. She is expected to be ready for service next summer.

The service to the West Indies which the Hamburg-American Line inaugurated by the sailing of the motor-ship "Orinoco" at the end of April forms a notable addition to the connections which Southampton has established with overseas ports. The fact that the Line are placing two new motor ships in the trade augurs well for its success.

Bristol Docks Extension.

Eastern Arm of Royal Edward Dock, Avonmouth, opened by the Prince of Wales. New Berths, Warehouses and Transit Granary.



View of Sheds "U" and "V" at the Eastern Arm Extension, Royal Edward Dock, Avonmouth, Bristol, opened by H.R.H. the Prince of Wales on May 23rd. The Transit Granary seen on the right forms part of the recently-completed scheme.

ON May 23rd the New Eastern arm of the Royal Edward Dock, Avonmouth, initiated by the Port of Bristol Authority in the Autumn of 1923, was opened by His Royal Highness the Prince of Wales. The new extension authorised by the Bristol Corporation Act of 1918 has cost £1,325,000 and provides 3,600 ft. additional quayage, six deep outer berths, two triple floor transit sheds, 500 ft. long by 106 ft. wide, and a transit granary of 12,000 tons capacity.

The Main Royal Edward Dock was commenced in 1902. The first sod was cut by H.M. King George V., then Prince of Wales, and the dock was declared open by H.M. King Edward VII., in July, 1908. The total cost of the work and the extensions since provided, including the scheme now completed, amounts to £4,816,000, bringing the total capital expenditure on the Docks Estate up to £8,650,000.

The new facilities were designed with a view to coping with an expanding volume of commodities and to meet the needs of the largest vessels using the Port of Bristol. The motive impelling the project has been one enlightened by a recognition not only of contemporary requirements of the trade and shipping of the port, but also of those likely to arise in the future. At the same time further facilities have been provided for the handling of goods at Sheds "U" and "V" and for the expedition of large grain cargoes at the new transit granary.

THE DOCKS OF BRISTOL.

The entire dock system of the port is owned by the Corporation of Bristol, and its administration is vested in a Docks Committee of the City Council operating under the title of the "Port of Bristol Authority."

The docks at Avonmouth—Royal Edward Dock and Avonmouth Dock—lie at the mouth of the River Avon, on the East Bank, at its junction with the Severn Estuary, and within the City of Bristol municipal boundary. All ships' berths, transit sheds, warehouses, granaries, cold stores, and tenants' premises are directly served by the Port Authority's railway lines which give independent delivery to the Exchange sidings of the Great Western Railway and London, Midland and Scottish Railway. A fine new roadway, known as "Portway," connects these docks for transport by road with the centre of the City and with the arterial main roads of the country.

The City Docks on the River Avon in the heart of the City, and Portishead Dock at the mouth of the river on the opposite bank to Avonmouth, in company with the Docks at Avonmouth, together make up the dock system of the Port of Bristol Authority.

THE PORT OF BRISTOL AUTHORITY.

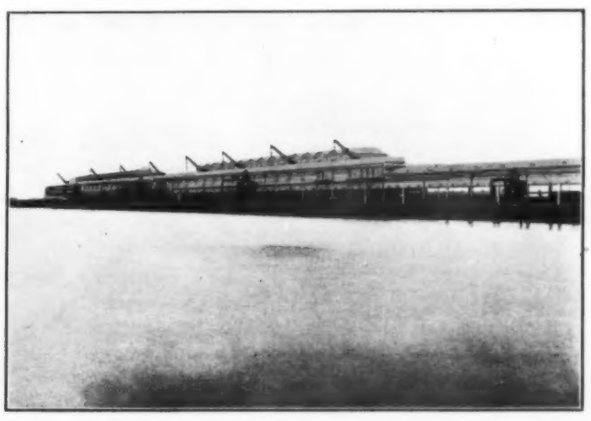
The Port of Bristol Authority is a committee of the Council of the City and County of Bristol. Alderman E. M. Dyer, the Chairman of the Port Authority, was during the period November, 1926, to November, 1927, the Lord Mayor of the City of Bristol. Owing to the high prices prevailing in 1918 the Port Authority did not feel justified in proceeding with the work and this resulted in the scheme being temporarily postponed.

The Port Authority being approached by the Unemployment Grants Committee in the Summer of 1923 gave special consideration to this question and with the approval of the Council it was decided to proceed with the scheme forthwith.

The Docks Engineer in the Autumn of 1923 was instructed by the Port Authority to prepare the contract drawings and specification and tenders for the work were invited in November, 1923. The majority of the leading public works and civil engineering contractors in the country made application for the specification and drawings and altogether twenty tenders were received.

On the 21st January, 1924, the Port Authority accepted the tender of Sir Wm. Arrol and Co., Ltd., of Glasgow for the wharves, buildings and excavation.

Reconstructed Transit Sheds at Bristol City Docks, with Coastwise and Continental Shipping in foreground.



A further View of the same side of the Eastern Arm Extension, beyond the Granary, showing Sheds "U" and "V."

Name.	Length of Lock.	Width of Lock.	Length of Dock.	Width of Dock.	Length of Wharfage.	Area of Dock Estate.		
						Water Area.	Land Area.	Total Area.
	FEET.	FEET.	FEET.	FEET.	FEET.	ACRES.	ACRES.	ACRES.
Royal Edward Dock (Avonmouth) ...	875	100	3,572	1,000	8,367	62	747	809
Avonmouth Dock	454	70	2,180	500	4,800	19	95	114
City Docks	350	62	—	—	14,694	83	86	169
Portishead Dock	472	66	1,800	360	2,829	12	64	76

The construction works undertaken by Sir Wm. Arrol and Co., Ltd., comprise the reinforced concrete wharves on the east and west side of the extension, two reinforced concrete treble floor transit sheds, a transit silo granary, grain galleries, the excavation of the Eastern Arm and other subsidiary works.

The capacities and dimensions of the respective docks are as above.

THE OPENING CEREMONY.

Upon arrival at the Bristol Joint Station His Royal Highness was received by the Lord Mayor of Bristol, Councillor John Curle; the Sheriff, Mr. J. A. Arrowsmith-Brown, D.S.O.; the Town Clerk of Bristol, Mr. Josiah Green; the Chief Constable of Bristol, Mr. J. H. Watson, C.B.E., and representatives of the civic and commercial life of the City of Bristol.

Following the inspection of the Guard of Honour, furnished by the Royal Naval Volunteer Reserve, the Royal Party left the Joint Station and proceeded via Victoria Street, Baldwin Street, Park Street, Whiteladies Road, Upper Belgrave Road, Bridge Valley Road and Portway, entering the Avonmouth Docks by the Gloucester Road Gates.

At " R " Shed, Royal Edward Dock, the Lord Mayor presented the Chairman of the Port of Bristol Authority, Alderman Edward M. Dyer, J.P., and the Prince then embarked on the R.M.S. " Bayano," a handsomely appointed vessel in the fruit trade, which later in the day left for Jamaica.

The vessel left the quay and proceeded down the Royal Edward Dock to the Eastern Arm Extension breaking the ribbon placed across the entrance of the extension and moored at Shed " V " at the inner extremity of the Arm.

Whilst the R.M.S. " Bayano " passed up the extension the children of the Avonmouth and Shirehampton Schools, accompanied by the band of the 6th Battalion the Gloucestershire Regiment, led the assembly in singing " God Bless the Prince of Wales."

At 12.35 p.m. His Royal Highness disembarked and mounted the dais. Upon taking his place the assembly sang a verse of the National Anthem, accompanied by the band.

The Town Clerk read an address of welcome to His Royal Highness from the Corporation of Bristol.

CIVIC ADDRESS AND REPLY.

In front of the stands he received the City's loyal address, which was read by the Town Clerk. This spoke of Bristol's rich associations with adventurers of the past and with the Empire oversea, and said it was the hope of the citizens that this extension would increase the City's commerce and enhance her position as " The Gateway of the West."

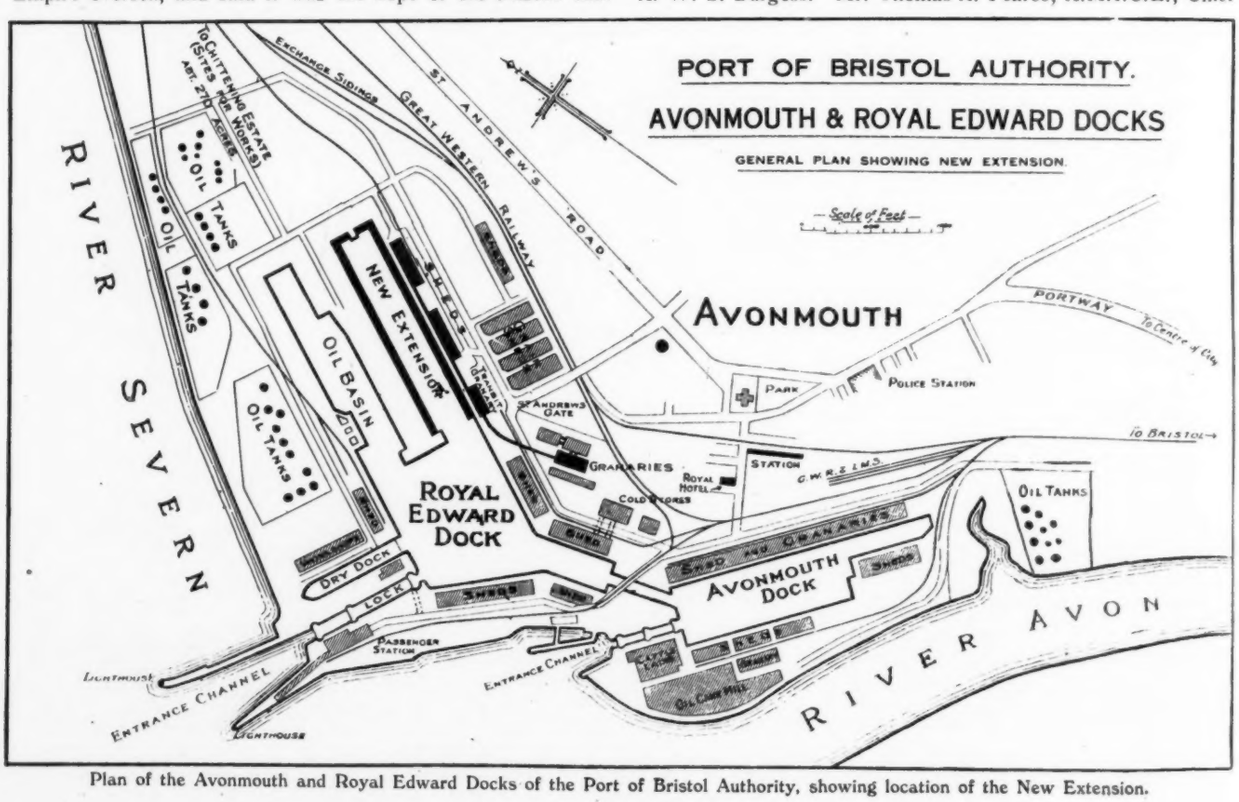
In reply the Prince said:—" I thank you, my Lord Mayor, for your welcome on my second visit to the City of Bristol, and I am proud to be here as Master of—specially—the Merchant Navy, to associate myself in the opening of the new arm of the King Edward the Seventh Dock with a step forward in the development of this great West country port. You have referred to the fact that this city and port have in their time played a prominent part in the creation of the Empire as we know it to-day. This was a reminder which was hardly necessary in my case, because I have had the honour to be made a Freeman of the Society of Merchant Venturers of Bristol and as such am able to recognise to the full the enterprise of those early pioneers, who sailed from here across uncharted seas to explore a new world and who in so doing laid the foundations not only of the British Empire but of the British merchant navy.

" This new Eastern Arm, with a deep-water area of 21 acres and berths for six large ships, will have the advantage of the latest type of transit sheds, granaries, warehouses, and elevators. I congratulate the Corporation of Bristol and all those who have been concerned in the successful completion of this great work on their foresight and the faith they have shown in the advent of better trade. The motto of this Port Authority is ' Provision for the present and preparation for the future,' and in this spirit I am confident that this new extension, which I have now much pleasure in formally opening, will, by facilitating commerce, and inter-communication, be one of the greatest benefits of the City of Bristol and Avonmouth."

Those present joined in the hymn, " All People that on Earth do Dwell," following which the Very Reverend the Dean of Bristol offered the Lord's Prayer and an invocation that the enterprise might be blessed and so directed to good and useful ends that it may promote peace, commerce and brotherhood between nation and nation. The Benediction was then pronounced.

THE PRESENTATIONS.

The following were presented to His Royal Highness by the Chairman of the Port of Bristol Authority: Members and Officials of the Port of Bristol Authority: Aldermen Sir Wm. Howell Davies, J.P.; H. W. Twiggs, J.P.; E. Parsons, J.P.; and Councillors Sir Sidney R. W. Humphries, J.P.; C. Hartly Hodder, F.I.C.S.; E. H. Parker, G. Shallard, R. F. Lyne, and A. W. S. Burgess. Mr. Thomas A. Pearce, A.M.I.C.E., Chief



Plan of the Avonmouth and Royal Edward Docks of the Port of Bristol Authority, showing location of the New Extension.

Engineer and Assistant General Manager; Mr. W. P. Wordsworth, A.M.I.C.E., Chief Assistant Engineer; Mr. W. A. Smith, A.M.I.C.E., Resident Engineer, and Mr. R. Fenton, Chief Clerk of Works.

Representatives of the Contractors: Sir Wm. Arrol and Co., Ltd.: Sir John Hunter, K.B.E.; Mr. T. B. Shore; Mr. John McNair Meighan, O.B.E., and Mr. H. J. Austin, Principal Foreman.

His Royal Highness left the dais and proceeded to luncheon, inspecting en route members of the Mons Club, the British Legion, Toc H. and a detachment of boys from the Portishead Nautical School, located on the waterside of Shed "V."

PROGRESSIVE POLICY OF THE PORT.

At the luncheon in "V" Warehouse following the opening ceremony the health of the Prince was proposed by the Chairman of the Port Authority. He expressed the gratification of the guests at seeing His Royal Highness in the uniform of the Merchant Service, and spoke of the willingness of the citizens of Bristol to spend money in preparation for the trade revival when it should come. The port already dealt with 10 per cent. of the grain imported into the United Kingdom, and they were not going to stop at that. As an instance of what might be done through the port's facilities, he mentioned that bananas from boats arriving at Bristol were on sale in London before the boats had finished discharging.

In response the Prince said:"I have first to thank the Chairman for his few words. He made some very nice references to myself. He told us about this great project and about the City of Bristol, and he also advised us to eat more fruit in the shape of bananas (laughter), which I feel sure we shall do, if it is only in recognition of and gratefulness for this splendid hospitality to-day. I am proud indeed to have been asked to come down and inaugurate this great extension of your docks in Bristol.

"I have from time to time during my travels round the world advised people to keep up to date and to go in for progressive methods as much as possible, on account of the great competition that there is in the world nowadays, so I am especially glad to inaugurate this great piece of progressive policy which you have achieved here in Bristol. I sincerely hope it is going to bring increased prosperity to Bristol. I should like to say to you, my Lord Mayor, that I am very happy to return to Bristol again. I have very pleasant memories of my other visits, and I am very grateful for the splendid welcome which your people gave me this morning." He then proposed the health of the Lord Mayor. Later, His Highness left for Maiden Newton. The official party inspected the Dock Extension and the S.S. "Bayano," afterwards rejoining the train.

THE EASTERN ARM EXTENSION.

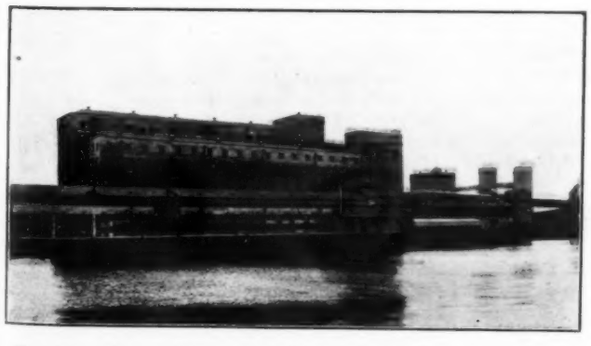
The new arm of the Royal Edward Dock, Avonmouth, is about 1,700 ft. long and 400 ft. wide, and there will be provision for three deep water berths on each side. The east side of the extension which forms a prolongation of the eastern face of the dock is equipped with two transit sheds, a transit silo granary and the grain conveyor gallery. The west side will be used in the early stages as an open quay for the berthing of vessels only and if warranted by improved trade conditions at a later date this side can be provided with single floor transit sheds and railway sidings.

The wharves are constructed in reinforced concrete and consist of a series of frames built at intervals of 12 ft. 6 in. centres carried on reinforced concrete piles. The frames of the wharves are covered with a reinforced concrete wall forming the face and a reinforced concrete retaining wall at the back.

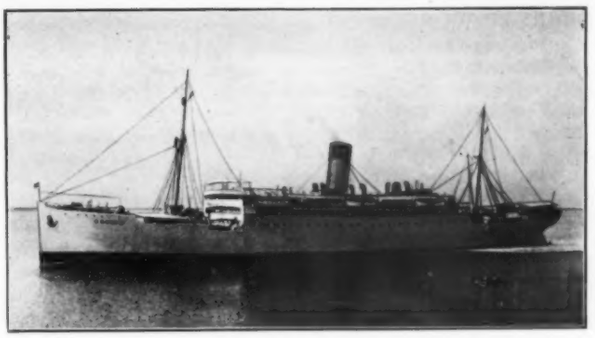
The design of the wharves is considered to be in many ways somewhat unique and there are many features which it is expected will prove to be extremely interesting to dock authorities and the engineering profession.

THE TRANSIT SHEDS.

Each of the new treble floor transit sheds, which are also of reinforced concrete, is approximately 500 ft. long and about 156 ft. wide. These buildings are constructed on reinforced concrete piles, the front portions of the structure being supported on the rear piles of the wharves.



The New Transit Granary of 12,000 tons capacity, connecting by Conveyor Galleries to Storage Granaries on the right.



The S.S. "Bayano," on board which His Royal Highness entered the Docks' Extension.

The sheds have each an internal capacity of approximately 2,600,000 cubic feet of air space, and the floors are designed to carry the heaviest loading. Each shed has a flat roof, a portion of which is covered with a steel building with slated roof, and these portions of the sheds will be utilised as warehouses for the storage of goods.

There is a connecting gallery at the first floor level between the sheds and to provide the best facilities for the discharge of ships; the shed equipment includes electric roof cranes, and two electric lifts are provided in each shed.

NEW TRANSIT GRANARY.

The transit granary, having a capacity of 480,000 bushels of grain, is also built of reinforced concrete and supported on reinforced concrete piles. The granary is built in two wings with a covered space between and this space houses the railway sidings to be utilised for the delivery of grain to railway trucks. The granary which is adjacent to the east wharf also serves for the direct delivery to merchants' craft lying in the Dock.

The grain trade at the Avonmouth Dock is a very important feature and in order to afford the utmost facility for handling the grain a continuous gallery has been constructed for the full length of the east wharf above the verandahs of the transit sheds. This gallery contains a series of conveyor bands fed by travelling pneumatic elevators which discharge direct from vessels lying alongside the wharf.

The transit granary and galleries are equipped with the most modern weighing and distributing apparatus and when the equipment is complete it is claimed that this grain handling plant is the most up-to-date in the kingdom.

There are three other granaries with a combined capacity of two million bushels in the vicinity of the Royal Edward Dock and these are all connected to the Transit Granary with a series of conveyor galleries.

THE NEW WATERWAY.

In furnishing the new waterway for the extension it has been necessary to remove a considerable quantity of excavated material. The contractors have utilised for this work an Arrol-Whittaker steam navvy on caterpillar wheels and this machine has done extremely successful work. It was not proposed to remove the whole of the excavation in the dry; a depth of about 10 ft. was left in, and this was finally removed by dredging. The total quantity of excavation removed in the dry is approximately 500,000 cu. yds. The excavated material has been deposited over various spoil lands on the Dock Estate and these reclaimed areas are now available for commercial purposes.

The water was admitted into the new extension on the 9th June, 1927, and dredging operations were commenced on 5th July, 1927, and completed on the 17th November, 1927. There was approximately 350,000 cu. yds. of material removed by dredging in connection with this scheme.

In addition to the works enumerated above a further granary of 800,000 bushels capacity has been constructed. This work was also carried out by Sir Wm. Arrol and Co., Ltd., who obtained the contract in open competition.

The wharves, transit sheds, silo granaries, etc., are built almost exclusively of reinforced concrete and the scheme is considered to be one of the largest of its kind in the country.

METHOD OF PILE DRIVING.

An interesting feature from the construction point of view was the novel method adopted by the contractors for driving the ferro-concrete piles. Steel piling frames were used and the piles were driven with a dead drop "monkey" of 3½ tons weight. The "monkeys" were operated by 80 h.p. electric motors with friction drives and the results obtained were most efficient and expeditious. By this means of operation the driving of the piles was continuous and the delays which usually obtain from other means of driving were obviated.

The total number of piles driven was 4,582 and the length varied from 54 to 62 ft., and the sectional dimensions were 15 ins. and 16½ ins. square. The heaviest pile weighed about 8 tons.

CONCRETE WORK.

It is estimated that the following quantities of essential materials were used in the carrying out of the work:—Cement 22,000 tons; crushed stone 65,000 tons; sand 40,000 tons; reinforcing steel 10,000 tons.

The whole of the cement and concrete materials were tested on the works before being used.

A 5 to 1 mixture of concrete was generally used in the reinforced concrete work and a safe compressive stress of 700 lbs. per sq. inch was allowed in the calculations. In using this mixture an increased percentage of cement was used as compared with the 6 to 1 mixture in general use, but it is claimed that by adopting this richer mixture with a corresponding increase in stress, an appreciable saving on the cost of the work was effected. The reinforced concrete piles were made with a 4 to 1 mixture of concrete.

The total cost of the scheme, including the equipment, is over one and a quarter millions sterling.

CONTRACTORS TO THE SCHEME.

Main Contractors for wharves, buildings and excavation ...	Sir Wm. Arrol and Co., Ltd., Glasgow.
Structural steelwork ...	Sir Wm. Arrol and Co., Ltd., Glasgow.
Sub-Contractors arranged by Sir Wm. Arrol and Co. for supply of materials:—	
Portland cement	South Wales Portland Cement and Lime Co., Ltd., Penarth.
Limestone chippings and grit	John Arnold and Sons, Chipping Sodbury.
Pitching	Wickwar Quarries, Ltd., Charfield.
M.S. Rods for reinforcement	Whitehead Iron and Steel Co., Tredegar.
	United Strip and Bar Mills, Ltd., Sheffield.
Sand	Aitken and Morcom, Ltd., Pontypridd (per F. Bowles and Sons, Cardiff).
Bollards (mooring) ...	John Lysaght, Bristol.
Pile shoes, spreaders and forks	F. H. Lewis and Co., Wolverhampton
Tar and creosote	Phillips and Son, London, S.W.1.
	Abertillery Pitch and Benzol Co., Ltd., Swansea.
Steel casements	Mellowes and Co., Ltd., Sheffield.
	Brunswick Metal Casement and Engineering Co., Ltd., Bristol.
Patent glazing	The Standard Patent Glazing Co., Ltd., Dewsbury.
Painterwork	Wm. Ash and Son, Bristol.
Glazier	W. Goldman and Son, Bristol.
Plumberwork	Nation Neale, Shirehampton, Bristol.
Galvanized sheeting ...	J. Summers and Co., Ltd., Shotton, Chester.
Galvanized ventilators, flashing, etc.	F. Braby and Co., Ltd., Bristol.
Gutters, downpipes, etc. ...	J. Jefferies and Sons, Bristol.
	Nation Neale, Shirehampton, Bristol.
	Alway and Beaton, Bristol.
C.I. frames and gratings ...	J. Jefferies and Sons, Bristol.
Joinery in doors, windows, etc.	E. J. Harris, Bedminster, Bristol.
	The Gloucester Joinery Co., Gloucester.
Ironmongery	Gardiner Sons and Co., Ltd., Bristol.
	Metal Agencies Co., Ltd., Bristol.
Pitchpine and redwood timber in roofs, etc.	Denny Mott and Dickson, Bristol.
	Price, Walter and Co., Ltd., Gloucester.
	Hill, Leigh and Hawkins, Ltd., Avonmouth.
Light steelwork in stairs, rails, grilles	Bushell and Co., Bristol.
	Stock and Collings, Bristol.
Lime	Thomas Bros., Newport.
Colliery waste and filling ...	The East Bristol Collieries, Ltd., Bristol.
CONTRACTORS.	
Dredging	K. L. Kalis Sons and Co., Ltd., London.
Machinery and Equipment:	
Grain handling machinery ...	Henry Simon, Ltd., Cheadle Heath, Stockport.
Pneumatic grain elevators and conveyors	Henry Simon, Ltd., Cheadle Heath, Stockport.
Electric movable roof cranes ...	Stothert and Pitt, Ltd., Bath.
Automatic weighing machines	W. and T. Avery, Ltd., Birmingham.
Portable automatic grain weighers	W. and T. Avery, Ltd., Birmingham.
Electric capstans	G. Russell and Co., Ltd., Motherwell.
Electric goods lifts, sheds "U" and "V" ...	A. and P. Stevens, Ltd., Glasgow.
Electric lift, No. 3 granary ...	Holt and Willetts, Ltd., Cradley Heath.
Electric lighting	Campbell and Isherwood, Ltd., Cardiff
Electric power cables ...	Siemens Bros. and Co., Ltd., Woolwich.
Low tension switchboards ...	George Ellison, Ltd., Birmingham.
High tension cables	Bristol Corporation Electricity Department.

TRADE OF THE PORT.

The trade of the year ending 31st March last included the following:—

Tonnage entered from foreign	2,119,592
Tonnage entered coastwise	1,156,478
Total register tonnage	3,276,070

Foreign imports were 2,143,297 tons. (This was the highest total attained in the history of the port, with the exception of last year, when the arrivals of 435,000 tons of coal gave an abnormal figure).

Coastwise imports amounted to 1,095,668 tons.

Foreign exports totalled 249,427 tons (representing a recovery to the highest figure for the last five years).

Coastwise Exports amounting to 312,324 tons showed an improvement on the last two years.

Among the more notable imports:—

Grain amounted to 4,297,328 quarters, representing over 10 per cent. of the total U.K. figure.

Bananas amounted to 6,002,123 bunches, distributed over the southern half of England and Wales and the Midlands, nearly 50 per cent. of the total U.K. figure.

Tobacco amounted to 23,825 tons. The City is the headquarters of the Imperial Tobacco Co. (of Great Britain and Ireland), Ltd.

Petroleum and Petroleum Products amounted to 376,025 tons, being the best year's import with the exception of last year, when the shortage of coal caused an abnormal increase.

Zinc concentrates. The importation of zinc concentrates from Australia for the National Smelting Company's works at Avonmouth amounting to 45,840 tons.

Flour, Meal, Rice and Offals amounted to 81,306 tons.

Oilseeds amounted to 57,323 tons.

Sugar amounted to 33,356 tons.

Timber and deals amounted to 139,508 loads.

GENERAL FACILITIES.

The landing stage at Royal Edward Dock—provided with spacious baggage and Customs examination rooms, postal and telegraph offices, and modern passenger station equipment—is directly adjacent to the ship's gangways and, under the same roof, gives direct access to the outgoing train.

Special trains from the landing stage are scheduled to convey passengers to London (Paddington Station) within two hours, the distance being only 120 miles (as compared with 200 miles from Liverpool and 230 miles from Plymouth) over one of the finest tracks in the world.

The Port of Bristol commands a large distribution area for imports and collecting area for exports. Produce through the port is distributed within a radius of 100 miles, embracing 1,500 railway stations and a population of ten millions. The grain storage accommodation at the port (mostly silo granary type) is ten million bushels.

General cargo is handled by electric cranes through spacious transit sheds provided with railway and road inland connections. Warehouse accommodation, in immediate connection with the transit sheds, provides for goods retained at docks.

Refrigerated stores at quayside, in direct connection with ships for intake, and with railway and road vehicles for delivery, cater efficiently for provisions, frozen meat, fruit and other perishables.

The oil installations on the dock estate cover an area of 60 acres, and there are 83 tanks with a total capacity of sixty million gallons. Oil fuel bunkering of steamers takes place within the docks.

Port of Kilindini.

New Customs' Arrangements.

In connection with the new arrangements that came into force at the Port of Kilindini on the 2nd April, 1928, His Majesty's Trade Commissioner in East Africa has sent the Department of Overseas Trade copies of two Press extracts, showing:—

(a) The manner in which Customs dues will now be assessed.

(b) The manner in which importers will complete forms for local, or up-country delivery.

In respect to shipping measurements, His Majesty's Trade Commissioner makes observations to the following effect:—

It is now desirable that in all cases, shipping measurements should be attached to, or shown on, invoices in order to facilitate local notification to the Railway in the case of consignments for up-country.

The measurements are prescribed upon the forwarding orders and, though in the majority of cases they are shown upon shipping documents, still it follows that delay in notifying the Railway of shipping weights and measurements may result in delay in providing the necessary truckage for shipments up-country. Regarding landing charges and assessment of customs duty, notification was some time ago sent to the Conference Lines that the 10s. 6d. per B/L ton landing charges hitherto collected with the freight in London is no longer collectable at that end. The new landing charges are payable upon importation and the first mentioned extract shows how they affect the assessment of Customs duty.

The Press extracts are from the Mombasa Times, 30-3-28, and can be seen by application to the Department of Overseas Trade (Shipping and Transport Section), 73, Basinghall Street, London, E.C.2.

North-East Coast Ports.

TYNE IMPROVEMENT COMMISSION.

The financial position of the Tyne Improvement Commission, as explained by Mr. Francis Priestman, Chairman of the Finance Committee of that body at the meeting in March, disclosed cause for much satisfaction. The accounts with which he was dealing were those of the previous twelve months and these showed that in the past year they had not only turned a deficiency of £123,000 into a surplus of £70,000, but they had been able to provide for capital expenditure and loan commitments for the early months of the present year. Another pleasing feature was a substantial increase in the income and in the volume of trade, both coal and merchandise. The income last year was £612,000, an increase of £38,000 over 1925. Coal shipments were higher by nearly a million tons, nearly the whole of which had gone abroad and the maintenance charges of the authority had been reduced by £50,000, which had enabled them to make a good showing on the year's financial operations.

At the same time Mr. Priestman had to deplore the fact that the burden of local rates had gone up with immense strides until they were nearly 200 per cent. above the 1913 level, and to meet this bill absorbed their gross revenue for thirteen days. In pre-war days the local rates equalled 2s. 9d. per week per man employed, now the figure was 9s. The dues averaged only 29 per cent. above pre-war level and since the first general cut was made in 1922, the huge sum of £1,360,000 had been handed back to the trade of the port. Mr. Priestman declared that none of the principal ports had reduced dues and charges to the extent to which the Tyne Commissioners had done. The expansion of the bunker trade was commented upon, and generally the tone of the meeting was distinctly optimistic.

BLYTH HARBOUR PROGRESS.

Probably no port on the North-East Coast of England has made such striking advances as Blyth, which, from a small inconvenient port suitable only for relatively small craft, has developed into one of the chief coal exporting centres with an annual shipment of about five million tons. On April 16th there was a formal opening of the new coal staiths, which represent a scheme of improvement which has been carried out jointly by the London and North-Eastern Railway Company and the Blyth Harbour Commission at a total cost of £300,000. This improved facility, it is hoped and expected, will increase the shipments by a million tons in the year, and not only can more coals be shipped at a time, but larger vessels can be accommodated.

Built in the new tidal basin at the Upper Harbour, the new staiths have been planned on the " slope gravity " principle, and project into the river from the north end. The basin is 400 ft. wide, and has a depth of 30 ft. at low tide. The staiths, 1,700 ft. in length, have two berths, each equipped with conveyor belts and a gravity spout. The conveyors have a range of from 12 ft. to 46 ft. With a capacity of 500 tons per hour, the No. 1 conveyor reaches 29 ft. from the quay face. The No. 2, or low conveyor, has a capacity of 800 tons per hour, and reaches 27 ft. from the quay face. An anti-coal-breaker crane also is provided to reduce breakages in the shipment of coal.

SHIPBUILDING ACTIVITY.

The Tyne shipyards have just created a record by launching six vessels within three days and of these no fewer than four were put into the water in one day. This indicates very rapid construction, and days ago when the s.s. " Livingstone " was launched from Messrs. Sir W. G. Armstrong, Whitworth and Co.'s Walker Yard, for the service on the Great Canadian Lakes, Mr. James Stewart, the managing director, stated that the vessel had been built in eleven weeks. He also mentioned that it was the 1,042nd vessel they had launched. The achievement was provocative of some eulogistic remarks, and Mr. T. H. Matthews declared that if all worked as they were doing at present he was confident of success.

BUNKER DUES.

There has been some criticism as to the mode of levying bunker dues in the Tyne, and a local firm state that when they took in 157 tons of bunkers at Tyne Dock after discharging their cargo prior to going to Seaham Harbour to load—a dozen miles southward—they were charged 2d. per ton plus 50 per cent. in pier dues instead of ¼d. per ton plus 50 per cent. charged for vessels in ballast. This meant to them £10 13s. 4d. extra. An appeal to the Commission was ineffective, as the latter body held that a principle was at stake, and they were empowered to levy dues to the further port to which the vessel proceeded, and under such circumstances, the vessel in question eventually went to Aalborg from Seaham Harbour.

It is not often that a Chamber of Commerce has to suspend a resolution before they can elect a man of their choice as chairman, but this was the case at the annual meeting of Sunderland Chamber, for on the minutes there stood a rule limiting the period for which any one president might serve to three years. It was the desire of the meeting that Alderman Sir Walter Raine, M.P., should be re-elected and this accordingly he was, after the obstructive resolution had been expunged. It is the fourth successive year that Sir Walter has served.

PERSONALIA.

Death has removed a well-known Newcastle shipbroker and coal exporter in the person of Mr. Cyril E. Short, who died on the 10th of April. For many years he was associated with Messrs. J. M. and J. Bartlett and Co. The association of the Short family with local commerce is an old one for Mr. Short's father was well known in shipping circles a generation ago.

A popular personality at Warkworth Harbour has passed away in Captain Thomas Esson, the Harbour Master, on April 12th. A native of Aberdeen, he had been at Warkworth for twelve years.

REDUCTION OF DUES.

The interesting announcement is made that at the beginning of July, the Tyne Commission will make a reduction of 10 per cent. on the export dues on coal and coke shipped from the river. The Chairman of the Finance Committee, Mr. Francis Priestman, when laying the proposition before the Commission, said they had been repeatedly pressed to revert to pre-war rates on coal shipped at their docks and staiths, and in 1923 they went half way, but were not prepared to go further. They felt that they would not be justified in specially favouring shippers who used the docks or staiths of the Commission, and that any reduction made should benefit the port as a whole, and not a section only. Some levelling of dues might have to be done, but not at present, and for that reason they came to the conclusion that the best thing they could do was to make a concession in the Tyne export due, which was payable on every ton of coal and coke that went out of the river. That would cost the Commission £12,000 a year. The reduction would bring down the average increase over pre-war rates to just half of what the Commissioners were authorised to charge —viz. 50 per cent.

The figures laid before the Commission at its meeting showed the need there was for the adoption of any course that would help in developing trade, for not only were coal shipments down for the first quarter of the year by more that 290,000 tons in 1927, but idle tonnage showed a decided increase, the number of vessels being nearly double that of a year ago. It may be noted, too, that the Blyth coal shipments for the quarter showed a falling off of 176,000 tons on the previous year, but on the contrary the River Wear Commissioners reported an increase of 14 per cent. for the first two months of the year, and expression was given at the last meeting of the Board to the opinion that before very long the Commission would have to consider the desirability of increasing the facilities for coal shipments. The cost would, no doubt, be considerable, but there would be a good revenue brought in. The Commission decided to continue the rebate of 1.60d per registered ton on vessels loading partly in dock and partly in the river.

COAL EXPORT TRADE.

The topic of diminishing trade was naturally referred to at the annual meeting of the North-East Coast Coal Exporters' Association at Newcastle-on-Tyne. The directors in their report stated the impediments to the district regaining its lost coal export trade were:—Excessive taxation, local as well as national; restriction of principal markets by the action of foreign Governments; excessive railway rates and dock charges, amounting in many cases from 70 to 100 per cent. above pre-war rates; and inadequate and obsolete loading facilities which resulted in increased freights. The report also criticised the coal marketing scheme as interfering with the economic law of supply and demand.

LOCAL TAXATION.

The burden of rates and taxes is a matter that can never be lost sight of on Tyneside, where the recent upheaval in the coal trade has left a heritage of public debt and high rates, but it was gratifying to all in the County of Northumberland to be told by the Chairman of the County Council Finance Committee that the coal trade had so far improved that there was an increase in the rateable value of £183,000 which of course is based on output so far as the collieries are concerned. The position was so much better that despite having to face higher expenditure, there was an actual decrease of 1¾d. in the £ on county rates.

The rating proposals as outlined in the Budget provoked a discussion at Newcastle Chamber of Commerce, which on May 2nd passed a resolution appreciating the promise of a remission of rates to industry but suggesting that some temporary measure of relief should be given at once, and that the complicated questions of the incidence of local rating, the methods of raising revenue for local purposes, and nature of the relief to be afforded by the State to rating authorities, and the burden of adult unemployment, should be considered by a committee of experts before permanent effect was given to the rating proposals outlined in the Budget.

DRY DOCKS ACTIVITY.

There has been considerable work lately placed with Tyne dry docks and pontoons, although the character of the repairs required in most cases was of quite ordinary character. The volume was sufficient to keep the firms well employed, and it was significant that when tenders were being sought a little while ago for fairly extensive repairs to a Swedish steamer, two firms in the district had so much work booked that they declined to quote.

The output from the local shipyards is well maintained, but it is no mean task to obtain new orders to keep the building berths occupied. The district is receiving orders from a large area as is indicated by the fact that during the past month vessels launched have included:—For the Tempus Shipping Co., Cardiff, built by Northumberland Shipbuilding, Howdon; for the Polish State Steamship Co., Gdynia, built by the Palmer Co., Jarrow; for the Matthews Steamship Co., Newcastle, by Armstrong, Whitworth, Walker; for the Venezuela Gulf Oil Refining Co., by Palmers, Hebburn; for the Ropner Shipbuilding Co., West Hartlepool, by Sir James Laing and Sons, Sunderland; for the Nitrate Producers' Steamship Co., London, by Short Brothers, Sunderland; for the Hungarian Levant Steamship Co., by Swan and Hunter, Sunderland; for the British Tanker Co., by Palmers, Jarrow; for the Booth Steamship Co., Ltd., by R. and W. Hawthorne, Leslie and Co., Hebburn; for A. and S. Oljefart, of Oslo Norway, by Swan and Hunter, Wallsend.

DEATH OF CONSUL.

A notable personality in the commercial life of Sunderland has been removed by the death of Mr. G. O. Wight, of the firm of Messrs. Wight and Co. In his earlier years Mr. Wight was assistant to the British Vice-Consul at Garrucha, Spain, later returning to his native town to engage in his father's business. For many years Mr. Wight was secretary to Sunderland Chamber of Commerce, and was also a member of the River Wear Commission, while for thirty years he was Belgian Consul for Durham County.

Recent Legal Decisions.

Liability of Dock Authority's Servants.

In *Bowman v. Vickers-Armstrong, Limited*, the plaintiff claimed £30 damages to his fishing boat in the following circumstances: Twelve hours after the launch of a vessel by the defendant company the plaintiff had moored his boat for fishing in the Walney Channel at Barrow. At 1.30 a.m. his boat was struck by what he discovered was the cradle, which had previously been fastened to Walney Bridge, 1,050 ft. down channel. The timber struck the riding chain, and—after almost pulling the bow under—clustered round the plaintiff's boat, and squeezed and strained it. It was contended that the defendant company was negligent in only using an inch-and-a-half rope to fasten 30 tons of timber, when a 30 ft. tide was running.

The defence was that the plaintiff had been guilty of contributory negligence, viz.: (1) Four days previously he had been told there would be a launch, and that his boat should be moved out of the way of floating timber; (2) the harbour master's notice stated that all yachts and boats in the vicinity of the slipway should be moved; (3) the plaintiff could have drawn his boat up on the beach. The evidence showed that the plaintiff's boat was about 3,000 ft. from where the launch took place; that mooring at that point was permitted on sufferance by the harbour authority; and that the defendant company had employed an independent contractor to collect the timber on the day of the launch. The learned judge decided in favour of the plaintiff on liability, but as the boat was from 30 to 40 years old he gave judgment for £15 only.

The familiar question of what constitutes discharge "alongside" has again arisen, and this time in connection with the Port of London—*Smith and Hogg, Ltd. v. Bamberger and Sons*, K.B.D., 17th February. Under Bills of Lading, various dates in September and October, 1926, which incorporated the terms of a charterparty, dated September 13th, 1926, made between the plaintiffs and the White Sea Timber Trust, it was provided that a quantity of deals, battens and boards shipped at Archangel should be delivered at Surrey Commercial Dock to the order of the Russian Wood Agency, Limited, or their assigns. The charterparty contained, *inter alia*, the following clause: "The cargo to be brought to and taken alongside the steamer at the charterer's risk and expense as customary." The property in part of the cargo passed to the defendants as indorsers of the Bills of Lading. The cargo was discharged in part on to the quay and in part into barges. The plaintiffs pleaded that in breach of their obligations under the bills of lading the defendants did not take the cargo from alongside the steamer and that in consequence they (the plaintiffs) carried the cargo to and stowed it in the usual place in the docks for discharged timber at a cost of £102 9s. 3d.

The defendants contended that the cargo was to be discharged according to the custom of the port of discharge, and pleaded that by the custom and practice of the Port of London the shipowner was, in the case of timber, bound to unload and stack it on the quay, alongside the ship. In the case of overside discharge they alleged that the custom was to provide only sufficient open lighters to receive the goods from the ship's tackle, and that the shipowner was bound to do the whole work of delivering the goods into the open lighters. They contended that they were under no liability in respect of the money claimed by the plaintiffs since, by the above customs, the shipowner was under an obligation to bear all costs of unloading and stacking on the quay and the delivery and stowage in the lighters.

Mr. Justice Wright after reviewing the evidence and the authorities, came to the conclusion from the decisions that, under a contract of this kind, when discharge was on to the quay, the cargo was "alongside" when it was available for release from the ship's tackle, on the quay, and the obligation of the receiver to take it away arose at that moment; but where the discharge was into barges it was the duty of the shipowner to place the cargo in the barge and the receiver's obligation only began after that had been done. The plaintiff shipowners in this case succeeded, therefore, in their claim against the defendant receivers in respect of the cargo discharged on to the quay, but their claim failed as regarded the cargo discharged into barges.

In *Wickett v. Port of London Authority*, 165 L.T.J. 144, the plaintiff was in charge of a lighter which was going through a lock leading from the Victoria Dock to the Thames. He was aware of the defendants' notice on the pierhead of the lock, viz.: " . . . Lightermen and others availing themselves of the facilities and assistance of the servants of the Authority in bringing their craft into and through the entrances of the docks must do so at their own risk. . . ." The defendants owned the dock and the lock, for the use of which they charged certain dues. Certain orders and directions were given to the plaintiff which involved the use of a rope. The latter broke while attached to the lighter, and injury was caused to the plaintiff. In his subsequent action for negligence the defendants contended that the plaintiff had accepted their dock master's services, and the use of the rope, on the terms of the notice. The jury found that the plaintiff had no option to refuse the rope and that the defendants were negligent. Mr. Justice Avory held, however (1) that *prima facie* the notice exempted the defendants from liability; (2) that the plaintiff having no option but to follow the directions was not incompatible with his having utilised the facilities provided on the terms of the notice. Judgment was therefore given for the defendants.

The last decision followed, *Forbes, Abbott and Lennard, Limited v. Great Western Railway Co.*, 44, T.L.R. 97. The plaintiff company's barge had loaded coal in Chelsea Dock, and was being passed through a lock into the Thames under the orders of the defendant company's dock master. The barge was strained through stranding on the lock sill, and the repairs cost £175. At the first trial the jury disagreed, but at the second trial a verdict was given for the plaintiff company. The defendant company then claimed to be exempt from liability under their published notice, viz.: " All barges or vessels while in Chelsea Dock are at the sole risk of owners or persons bringing or causing the same to be brought into the dock." Mr. Justice Avory held that this was no defence, and gave judgment for the plaintiff company. The Court of Appeal reversed this decision. The Master of the Rolls said that it appeared to him that the words used in the condition were intended to cover negligence, and they were quite apt to do so. Lord (then Lord Justice) Atkin considered that the word " dock " in the above notice must be construed as including " lock." Lord Justice Lawrence concurred that the defendant company had desired to guard against the negligence in question.

PORT OF LONDON CONTRACT.

The East Ferry Road Engineering Works Co., Ltd., Millwall, has received an order from the Port of London Authority for twenty portable hydraulic luffing cranes for use in the various London docks. These cranes are of 30 cwt. capacity, with a maximum radius of 65 ft. With contracts completed and in hand, the above makes a total of 86 cranes of this type supplied by the Company to the Authority.

BIG BARGE TOW FROM PITTSBURG.

Among recent arrivals at New Orleans was the steam towboat "Monongahela" with fourteen barges loaded with steel from Pittsburg. The trip required seventeen days and was begun with seventeen barges totalling 16,450 tons of freight. Three were delivered at cities on the Ohio River.

RAIL EXTENSIONS AT NEW ORLEANS.

The President of the Lousiana and Arkansas Railway Company, Mr. Harvey Couch, inspecting the harbour facilities of New Orleans recently, announced that subject to the approval of the Interstate Commerce Commission, that Railroad and the Lousiana Railway and Navigation Company will effect a merger and spend three million dollars on improvements which will give the Port new trunk line connection with the rich producing areas of North-West Texas and Arkansas.

Irish Harbour Matters.

NAUTICAL TRAINING.

Conducted under the auspices of the Irish Free State Ministry of Education, the Irish Nautical College and Training School, Eden Quay, Dublin, is doing excellent work in giving boys and men a general knowledge of navigation, signalling, seamanship, chart work and kindred subjects. Students also take courses of instruction for certificates as second mates, mates and masters in the mercantile marine.

The Ministry of Education provides 75 per cent. of the costs of working, the Committee of Management having to raise the other 25 per cent. which amounts to about £150 per year. Up to 1924 the School was carried on by private enterprise. It was then closed for a time owing to post war expenses, and as Mr. David Barry, O.B.E. pointed out at a recent meeting of the Committee, the Government, recognising the need for such a school, called together representative shipowners and others in the Port of Dublin and made the financial suggestion which has now been adopted with considerable success.

The School is drawing students from all over Ireland and certain parts of England and Mr. Barry made a special appeal to firms in the Free State further to assist by additional funds with the object of eventually providing a training ship where boys could get a practical training in seamanship. It spoke well for Irish boys that big shipping companies in England were taking them on. The Principal of the School is Capt. R. E. Kellett.

FREE STATE VESSELS.

On the 31st December, 1927, the Irish Free State mercantile marine consisted of the following:—

	No. registered in 1927	Net Tonnage	Gross Tonnage
Steam Vessels	150	51,272	108,936
Motor Vessels	246	4,466	7,299
Sailing Vessels	160	8,475	8,475
Fishing Vessels of over 15 tons	174	4,788	—

The net tonnage of merchant vessels in 1927 was 64,213 as against 65,066 in 1926, while the gross tonnage was 124,710 in 1927 and 126,395 in 1926.

LIFE SAVING SERVICE.

The Coast Life Saving Service, with the 20 lifeboat stations maintained by the Royal National Lifeboat Institution constitutes the chief means of life saving on the Free State coast.

Fifty-three stations have been established, each worked by a volunteer company, or usually, fifteen trained men under selected leaders, of whom there are two. The No. 1 man also acts as caretaker. At the four Cliff Ladder stations the company consists of eight trained men, one of whom acts as No. 1 man and caretaker. All the stations are fully equipped with the necessary apparatus and the companies are exercised at regular intervals.

Between the re-establishment of the Coast Life Saving Service in the last quarter of 1923 and the 31st, December, 1927, twenty-two lives were saved by means of the rocket apparatus.

MOTOR PARTS BY LINER.

During the first week in May, seven tons of motor parts were landed at Cobh (Queenstown) from the trans-Atlantic liner, "Baltic," for the Ford Motor Works, Cork. This is the first delivery of its kind to be made at Cobh by a trans-Atlantic liner.

BELFAST TONNAGE INCREASES.

The Belfast Harbour Master's report received at a meeting of the Harbour Commissioners on the 1st May, showed that 287 vessels arrived at the port from the 15th to 28th April; coastwise and cross channel 266, foreign 18 and non-trading 3. The total tonnage of the vessels which arrived from 1st January to 28th April was as follows:—Coastwise and cross channel 728,948, an increase of 33,219 over the corresponding period of 1927; foreign, 188,104, a decrease of 29,200; non-trading, 24,867, an increase of 3,585.

The total tonnage at 941,919 shows an increase of 7,604 tons.

LAUNCHES FROM BELFAST.

From their East Yard, Belfast, on April 20th last, Messrs. Harland and Wolff, Ltd., launched the S.S. "Punta Gorda," a shallow draft oil tanker, built to the order of Messrs. Andrew Weir and Co., for the Lago Shipping Co. This is the fourth of five similar vessels ordered from Messrs. Harland and Wolff. It is classed A1 at Lloyds, being specially designed for carrying petroleum in bulk. It measures 351 ft. in length by 50 ft. in breadth and has a gross tonnage of about 2,360.

The following day Messrs. Harland and Wolff launched the "King Stephen," the eighth of the vessels ordered by the King Line.

A ROAD SPRAYING MATERIAL.

On the East Wall Road, Dublin, adjoining the Great Southern Railway and the Alexandra Dock, the firm of Colfix (Dublin), Ltd., is building a factory for the manufacture of their preparation of bitumen and tar for cold application to roads. It is very favourably situated, with a special railway siding to facilitate the despatch of "Colfix." The building is 124 ft. long by 36ft. in width and is constructed of all steel frames covered with corrugated cement asbestos sheets. The machinery comprises stills, pumps and boilers; the boilers being supplied by Messrs. Yeats, Belfast. Messrs. Smith and Pearson, Ltd., supplied the iron work, while the general contractors are Messrs. J. and R. Thompson, Ltd., Fairview.

STEAM PACKET EXTENSIONS.

Messrs. J. and P. Good, Ltd., are building for the British and Irish Steam Packet Co. at the North Wall, Dublin, a large steel framed concrete shipping stores, Customs office and waiting room for passengers by their popular Dublin to Liverpool service. The all-over measurements of the new premises are 250 ft. by 120 ft. They adjoin the Company's existing premises at North Wall and are part of a scheme to meet the growing demand on the Company's services.

NEW CRANE FOR DUBLIN.

To their electrical crane equipment at Sir John Rogerson's Quay, the Dublin Port and Docks Board have now added a Smith-Walls patent level-luffing 4-ton crane to meet the growing needs of business on the South side of the Liffey. This crane is of unusual type, being the first of its kind to be built and erected by Messrs. T. Smith and Sons, Rodley, Leeds. The jib is on the balance principle and does not require any jib ropes or rods to keep it in position. The only rope about it is the winding rope, and no matter at what angle the jib is, the load remains level. The crane is described as absolutely fool proof and should certainly be a great advantage to traders.

THE LIFFEY TUNNEL.

The Minister for Local Government and Public Health has sanctioned the raising of a loan of £37,500 by the Dublin City Commissioners towards the cost of the Liffey tunnel. This tunnel is now nearing completion. It has been constructed to the order of the City Commissioners by Messrs. McAlpine (Ireland), Ltd. It is 60 ft. below the bed of the river, is 820 ft. long and 7 ft. in diameter. At each end is a vertical shaft, one, 107 ft. and the other 112 ft. deep, both being 4 ft. in diameter. The object of the tunnel, which runs from the North Wall Extension to the South Wall, is to carry water and electric mains and sewage pipes from one side of the city to the other.

DUNDALK SHIPPING RETURN.

Dundalk Harbour Board, during the month of March experienced a reduction of 1,721 tons. This was due, it is said, to the fact that there had been only one sailing weekly by the Steam Packet Company.

TRANSPORTER BRIDGE FOR DUBLIN.

The Dublin Port and Docks Board are now seeking powers to rebuild Butt Bridge and to construct a transporter bridge lower down the river to relieve the existing congestion of traffic on the quays. The Board have purchased from Messrs. T. and C. Martin, Ltd., a frontage, 150 ft. in length for the purpose of widening the Northern Quays at this point.

Quite recently some of the Members of the Board inspected the working of transporter bridges at other ports and were favourably impressed with the capabilities of these bridges for handling traffic. The Board also, in order to provide berthing accommodation for the larger type of vessel now frequenting the port, have decided to continue the reconstruction of the Alexandra Wharf at a cost of roughly £100,000; also, to meet the increased demand for warehouse facilities, the Board are now contemplating the construction of an additional warehouse specially adapted for the storage of tobacco.

New industries are springing up around the port as is evidenced by the recent lettings of factory sites to continental and other firms.

MANCHESTER AND EXPORT CREDITS.

In view of the great increase in the volume of business which the Export Credits Guarantee Department is insuring for Lancashire exporters, Mr. Douglas Hacking, the Secretary of the Department of Overseas Trade, has decided to appoint a local representative of the Department in Manchester.

Mr. Hacking has been in communication with the Manchester Chamber of Commerce on the subject and the President and Board of Directors of the Chamber have very courteously agreed to make available for the Department's representative, temporary accommodation, in the offices of the Chamber. Mr. Hacking has accordingly arranged that Mr. S. Judson, of the Export Credits Guarantee Department, shall take up his duties in Manchester on the 1st May.

Exporters in the district who desire particulars or explanations of the scheme should therefore communicate with Mr. Judson at the offices of the Chamber.

It is hoped that this arrangement, which is experimental, will greatly facilitate the transaction of business under the Export Credits Guarantee Scheme, as it should obviate much preliminary correspondence and enable exporters to obtain the fullest information on the spot.

French Wharfage Dues.

Provisions of the New Law.

INTRODUCTION.

A new Law dealing with Wharfage dues was passed by the French Parliament on March 28th, 1928. Some dues have been raised from three to five times the pre-war figures, but owing to the fall of the franc and new features of the Law, the use of French ports is not expected to be on the whole more expensive than of late, as had been expected.

DISADVANTAGES OF FORMER LAWS.

Wharfage dues established in France in 1872 taxed net tonnage only, this was altered in 1897 and 1898 and the ratio between net tonnage and the amount of cargo handled became the new basis. In recent years amendments were made but did not remedy the following drawbacks.

Under the old regulations a few more tons of cargo handled at a port often meant the doubling of dues.

Vessels were scheduled as engaged in Foreign or International Coasting trade according to their last port of call and taxed accordingly.

For instance, a ship plying between Hamburg and America and calling at a French port paid Coasting trade dues Westbound and Foreign trade dues, Eastbound.

Another disadvantage arose in 1920 with the establishment of self-managing harbours, which are entitled to a share of the wharf dues, and in some cases were deprived of it, as ships calling at several French ports were allowed to pay the total amount of the dues at whatever port they chose.

The new law has done away with these inequalities.

THE NEW LAW.

Article 1. The wharf due established by the Law of January 30th, 1872, is to be paid at the French and Algerian ports according to the net tonnage, the purpose and importance of the call.

The dues are treated as Customs duties in respect of entries, payments and fines. They are to be paid for vessels of all nationalities, by the Captain, the shipowner or their representative within twenty days of date of arrival and before the ship's departure.

False returns of weight, nature, origin, destination or any other infringements involve a fine amounting to five times the proper amount payable.

Article 2. Tax on registered tonnage. At each port the following dues will be paid:—

(1) Ships to or from Foreign trade ports, on entering and on leaving the harbour, one franc per registered ton.

(2) Ships from or to International Coasting trade ports. Ships leaving for or coming from ports within the International Coasting trade limits, specified in Article No. 1 of the Law of January 30th, 1893, and Article No. 15 of the Law of April 15th, 1906, will pay only 50 centimes per registered ton on entering and on leaving the harbour when their passenger or cargo traffic for or from France is not for or from Foreign trade ports.

Ships calling at several French or Algerian harbours, without visiting other countries in between their calls, pay full dues on entering the first harbour and on leaving the last one, and 25 centimes per registered ton each time they enter or quit an intermediate harbour.

Ships for public use, having a French terminus and sailing according to schedules will pay full dues at this port, and 25 centimes per registered ton each time they enter or leave other harbours.

Article 3. Reduced taxes for Regular Lines. Vessels for public use, sailing according to schedules, having their terminus either in France or abroad will benefit by the following reductions in dues.

30 per cent. where a Shipping Line's service calls once a month; 40 per cent. twice; 50 per cent. three times; 60 per cent. four times; and 70 per cent. more than four times at the port.

Article 4. Maximum amount of dues. The amount of dues charged for according to Articles No. 2 and No. 3 will not exceed the aggregate sum of ten times the amount of the dues of Articles Nos. 6 and 8, and twice that of Article No. 7.

Article 5. Cases where dues are not exacted. The above mentioned dues will not be exacted in the following cases.

The entering ship, having traded with French or Algerian harbours or not intending to disembark passengers or cargo at the port.

The leaving ship having embarked neither passengers nor cargo at the port, or not intending to trade with ports other than those of France and Algeria.

Ships engaged in "Navigation de cabotage réservé" having called abroad to leave cargo without taking any return load.

Ships entering the harbour with ballast only, even when intending to load cargo at the port.

Tugs, even when towing a vessel; ships to be scrapped; warships; ships of the cable services; and pleasure craft.

Fishing vessels loaded with French catches and owner's belongings only.

Excursion ships taking back all the passengers they have brought.

In war time, hospital ships according to the agreement signed at the Hague on October 13th, 1907.

Article 6. Tax on weight of cargo handled at the port. The following dues are to be paid on tonnage handled at the port.

Foreign trade:—

Per 10 metric tons (10.000 kilogrammes) or fraction of same.
Unloaded: 27.50 francs first class; 13.75 francs second class.
Loaded: 10 francs first class; 5 francs second class.
Unloaded: 13.75 francs first class; 7 francs second class.
Loaded: 5 francs first class; 2.50 francs second class.

Coasting trade:—For cargo from or to ports within coasting trade limits (French and Algerian ports excepted).

Per 10 metric tons or fraction of same.

Classification. The first class includes all that is not mentioned as second class.

Second class goods comprise:—Rods, stakes, stanchions, logs and faggots, resinous logs, pit props, coarse sulphate of aluminium, chalk, limestone flux, rotten stone, talc in lumps, sand, pebbles, road rubble, cobble stones (paving stones), coarse stones for building purposes, unglazed bricks, tiles and pottery without ornaments, plaster, lime and cement, phosphate ores, ice, coal, coke, patent fuel, pyrites, aluminium and iron ores, iron works clinkers, mineral pitch, metallurgical products, scrap iron (old iron) and shavings, fuel oil.

Article 7. Taxes on Passengers. For passengers embarking or disembarking at the port the following taxes will be paid.

(1) Passengers to or from Foreign trade ports.

50 francs per passenger occupying a "de luxe"; 30 francs first class; 20 francs second class; and 10 francs third class cabin or suite; 5 francs per emigrant.

(2) Passengers to or from Coasting Trade ports (French and Algerian ports excepted).

25 francs per passenger occupying a "de luxe"; 15 francs first class; and 10 francs second or third class cabin or suite; 5 francs per emigrant.

The following reduced taxes:—10 francs per passenger occupying a "de luxe" cabin, 5 francs first, second or third and 2.50 francs per emigrant, will apply only to passengers to or from The British Isles, The Channel Isles, Belgium, Holland, Spain, Portugal, Italy, Tunisia and Morocco.

No tax will be paid in the case of passengers embarked at the Government's request, or according to reduced fare contracts passed between the State and the Shipping Companies.

Article 8. Taxes on cattle, luggage and fuel. Dues on cattle, horses, mules and donkeys are reckoned as one ton of cargo per capital; in the case of sheep and goats, as one-fourth of a ton.

Pasengers' luggage, ship's victualling and fuel are not liable to taxes.

Article 9. Special rules for Algerian harbours. In Algerian harbours, the tax of Article 2 for leaving the harbour does not apply. Neither are the taxes in Articles 6 and 7 imposed on cargo and passengers embarking at these ports.

The maximum amount of dues to be paid is limited to ten times the dues of Articles 6 and 8.

A reduced tax of 10 francs applies only to passengers to or from Spain, Italy, Tunisia and Morocco.

Article 10. The laws of December 23rd, 1897, and March 23rd, 1898, as well as Articles 381 to 388 of the Minister's decree of December 28th, 1926, dealing with Customs matters are repealed.

Port Dues in Yugoslavia.

Prevailing Rates of Exchange.

The Department of Overseas Trade received from the Commercial Secretary at Belgrade the following list of official rates of exchange for the payment of port dues in Yugoslavia during the month of May.

	Dinars.
1 Gold Napoleon	218.95
1 Pound Sterling	277.30
1 American Dollar	56.80
1 Canadian Dollar	56.50
1 German Mark, Gold	13.58
1 Belga	7.98
100 French Francs	223.65
100 Italian Lira	229.50
100 Dutch Florins	2290.50
100 Rumanian Leis	35.60
100 Danish Crowns	1523.00
100 Swedish Crowns	1524.50
100 Norwegian Crowns	1519.50
100 Spanish Pesetas	952.50
100 Greek Drachmas	74.70

Personal enquiries regarding all shipping and transport matters should be made at the City Office of the Department (Shipping and Transport Section), 73, Basinghall Street, London, E.C.2.

Notes from the North.

RIVER DEE WHARFAGES.

Speaking at annual meeting of the Joint Board of Chester Port Sanitary Authority at Mostyn on May 8th, Dr. Humphry Williams said that during 1927, more vessels (coastwise) entered the wharves from Chester to Connah's Quay inclusive, than during any of the last thirty-four years; and that with the extension of the high training bank now in course of construction, much more improvement will he secured. For some years the condition of the river from Bagillt up to Chester from a navigation point of view has been giving anxiety, the channel altering very much as to its course and depth of water so that it is difficult for large vessels to proceed up the river, and this may be part of the reason why no foreign vessel entered any of the ports except Rhyl during 1927. Mr. Joseph Forber said when the work of extension of the high training bank was completed, ever greater improvement could be anticipated. This important work would be a great determining factor in the trade and fortunes of the river in future years.

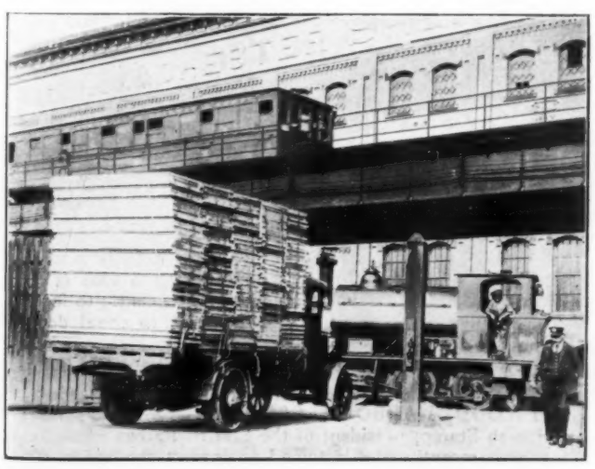
RE-OPENING THE WOODSIDE FERRY STAGE.

After being closed for over three months as the result of damage caused by a steam coasting vessel being swept beneath the pontoons, the Woodside Ferry Stage was re-opened for passenger traffic on May 8th. Although the whole of the work is not yet complete sufficient headway has been made to permit the travelling public to be accommodated in the portion of the stage which was formerly alloted to them, and it is expected that the whole of the work will be completed in a few weeks time. The accident resulted in a cost to the Birkenhead ratepayers of about £15,000. The steam coasting vessel "Jennie" was leaving Monks Ferry coaling slipway when she was swept by the strong ebb tide against the stage and became wedged below the pontoons, remaining fast for a few days until she was moved and beached at Tranmere. Four of the pontoons were holed, and the heavy iron girders supporting the deck of the stage were cracked, while through the snapping of the roof supports over the passenger waiting accommodation, there was fear of the roof being carried away. While repairs were being carried out, passenger boats used a portion of the luggage ferry stage. With the re-opening of the major portion of the re-built passenger stage, the three main gangways can again be used.

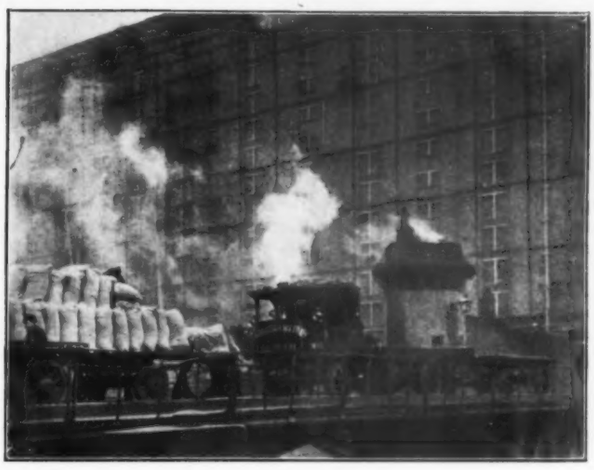
MANCHESTER DOCK (LIVERPOOL) TO DISAPPEAR.

One of the Liverpool docks—Manchester Dock, adjoining Canning Dock—is to be filled in and built upon. This decision was reached by the Mersey Docks and Harbour Board on May 10th, when they adopted the following recommendation of the Works Committee:—"That the Manchester Dock be filled in, and that John Rearden be allowed to dump excavations from the Mersey Tunnel into the dock; that the engineer be authorised to construct a permanent wall across the river entrance to the dock, and to pave with dry-sett paving the area filled in; and that the whole of the Manchester Dock premises, including the area filled in, together with the two storey building at the corner of James Street and Irewell Street, be let on lease for a period of sixty years, to the Great Western Railway Company." The Great Western Railway Company has not used the water space of the dock for some time, and no longer requires it. Hence the request to the Dock Board to close it. What the Great Western Railway now requires is further accommodation for their motor traffic.

The actual date of origin of the Manchester Dock is clouded in obscurity. It was in existence before the present Dock Board was created. It was purchased in 1851 from the then owners, the Liverpool Corporation. Some time last year the dock sill blew up, and, it is understood, the damage was not wholly made good. Before that, it was used for barge traffic by the Great Western Railway Company, whose warehouse buildings still flank it on two or three sides. When the dock is filled in, the Great Western Railway will build a big goods depot, equipped with the latest appliances for the most expeditious and economical handling of freights.



An unusual meeting at Liverpool Docks' Entrance, showing one of the Mersey Docks' Board Locomotives, the Overhead Railway and a Motor Waggon seeking an outlet from the Docks.



The Stanley Dock Tobacco Warehouse, Liverpool, one of the largest Warehouses in the World.

LOWER HARBOUR RATES.

The Mersey Docks and Harbour Board has directed that, as from the 4th of May, 1928, inclusive, the present addition of 20 per cent. to the Harbour Rates on all vessels except steam vessels engaged in the fishing industry, be discontinued and also that a reduction of five per cent. be made in the Harbour Rates on all vessels as printed on page 24 of the Schedule of Rates and Dues on ships and goods.

PLEA FOR BRITISH SETTS.

Mersey Docks and Harbour Board has received a communication from the National Federation of Granite and Roadstone Quarry Owners, that owing to the great amount of unemployment in their industry, in future tenders placed by the Board consideration should be given to British goods. The letter states, *inter alia*, that due largely to the use by local authorities of foreign instead of British setts, serious unemployment exists in the British setts quarrying industry, and many quarries in various parts of the country are either closed down or are on short time. The price of large outputs of British setts compares favourably with that of the foreign article.

THIRTY-FIVE TON PIPE LOST.

During a heavy swell, the Mersey Dock and Harbour Board dredger "Burbo," while engaged in the Mersey channel recently, lost a sandpipe, an important part of its equipment. The pipe, which weighs about thirty-five tons, became embedded in the ground and it was necessary for a special camel to be dispatched to hold the tremendous weight, and carry it safely into the river. The pipe was transferred to Brunswick Dock where a powerful crane was engaged to lift it to a safe place on the quay.

BIRKENHEAD RECONSTRUCTION SCHEME.

The goods station owned by the Great Western Railway Company at Morpeth Dock, Birkenhead, is to be reconstructed. When completed, it will be the largest and most up-to-date in the North of England. The alterations are intended not only to provide for the expeditious handling by the most modern mechanical appliances, of the enormous volume of business now passing through that centre to all parts of the country, but also to meet the developments taking place on Merseyside and the great possibilities opened up by the new Mersey Tunnel, one of whose entrances will be adjacent to the new station. At present there is accommodation for about 540 trucks, but the reconstruction will give facilities for 850.

The existing private dock under cover for barge traffic, is to be abolished. The water will be withdrawn, the entrance into the Morpeth Dock sealed up, and the dock converted into a commodious goods shed, fitted with electric lifts. The roof of this great storehouse will be part of the floor of the new station, and above it, spacious offices are to be erected, with electrical labour saving appliances for clerical work. The new floor over the dock will be laid out with platforms, cart roads, and railway lines. Accommodation is to be provided also for the heavy traffic dealt with by barge to and from ships at berths in the Morpeth Dock adjoining the station, on the north side of which the company has a shed adequately equipped. All the sidings will be laid down on modern principles to enable incoming trains to be distributed and trucks placed into position for unloading without loss of time, and electric capstans with reels will be utilised for the quick

marshalling of trucks into train order. There is to be a "Goliath" travelling gantry crane, spanning three sidings and adjoining cart roads, capable of lifting weights up to thirty tons, and a weigh-bridge of thirty-five tons capacity, with an automatic device for weighing motors, carts, and other road vehicles, will be installed.

G.W.R. ACTIVITY.

The Great Western Railway Company is making important improvements at its depots on the Liverpool side, where goods are received and transported by motor vehicles via the ferries, for dispatch from Birkenhead by the night trains. A motor garage has already been erected to house a large fleet of motors. At present hundreds of motors and a large number of "containers" (lift vans) are employed daily in conveying goods by ferry to the Birkenhead terminus.

DEFINING THE PORT.

Since writing in a recent series of these notes, of the case before the Liverpool Assizes, where the Judge was asked to decide whether Birkenhead was in the Port of Liverpool, the ruling of the Judge that, for the purposes of a charter party and a bill of lading, Birkenhead is part of the port, has caused much concern in commercial circles. From inquiries made by the Chamber of Commerce it appears that the decision of the Court will not affect cargoes carried by the regular liners, as rather dealt with cargoes by chartered steamers. Further, it appears that the possibility will be extremely remote of goods shipped by regular liners being discharged at any except the usual discharging berth, even if the bill of lading was made out to the "Port of Liverpool." Other associations that had been consulted in this matter had expressed the opinion that it would be impossible to take any action which would alter the usual conditions of shipment to the "Port of Liverpool," and that if consignees wished their goods landed at Liverpool, especially in the case of chartered steamers, the bill of lading should be made out to "Liverpool," and not to "the Port of Liverpool.' The Mersey Docks and Harbour Board were also asked whether it would be possible to give any ruling on this question. The general manager and secretary pointed out that even if the Board made any statement on the subject it would have no binding effect, and that it would be as well for those members who desired guidance in particular cases to be advised by their own solicitors. The Council of the Chamber of Commerce takes the view that, in order to make quite certain that goods are landed in the Liverpool Docks under the control of the Mersey Docks and Harbour Board, it should be possible in the case of chartered steamers to negotiate with the steamship owner for bills of lading to be worded: "To be landed at the Liverpool Docks, not at Birkenhead."

PETROL DISCHARGING PLANT.

Preston Town Council, by 18 votes to 11, has confirmed a resolution of its Ribble Navigation Committee accepting a tender of Messrs. Galloway, Ltd., of Manchester, for two Lancashire boilers and other plant for discharging petrol, for the sum of £2,070, in preference to the tender of a local firm (Messrs. Fosters, Ltd.). Replying to opposition speakers who urged the acceptance of the local tender, Alderman Parkinson, chairman of the Ribble Committee, said they had asked for tenders, and a principle was involved. If the Committee's recommendation was not accepted, he had finished as chairman of that committee.

CONSULS INSPECT DOCKS ESTATE.

To demonstrate to the members of the Liverpool Consular Corps the manifold resources of the Liverpool Dock Estate, the Mersey Docks and Harbour Board arranged a tour of the docks. Sixteen representatives of other countries accepted the invitation, and after their visit to the docks they were entertained to tea by Mr. L. A. P. Warner, general manager of the Board, and other officials who had accompanied them on their tour. The visit arose as a result of the Consuls' attendance at the Royal opening of the Gladstone Dock last year, when many of them felt they would like to see more of the Dock Board's work. They were taken first to the Stanley tobacco warehouse, the biggest in the world, where they saw £23,000,000 worth of tobacco in storage, and watched the opening, sampling and resealing of huge hogsheads, each containing over £500 worth of tobacco, collected from all parts of the world. They next visited the Alexandra Dock premises of the Union Cold Storage Company, stopping on the way to see the battered hull of the "Montrose" lying in the Sandon Dock after its collision with an iceberg in mid-Atlantic. From the cold stores, the Consuls were taken to the Gladstone Dock, where they were able to explore the huge sheds and water area in greater detail than was possible when they saw the dock opened.

NEW REFRIGERATORS AT WOODSIDE.

New refrigerating plant to bring the refrigerating equipment and chilled rooms, etc., at Woodside Lairages into line with modern requirements, has just been put into commission by the Mersey Docks and Harbour Board. The new plant comprises three vertical single acting ammonia compressors, each compressor having four cylinders and direct coupled to a Crompton-Parkinson motor, capable of developing 90 b.h.p. Any two of the compressors are capable of reducing the temperature of the 23 chill rooms to the required temperature. The capacity of these chambers is 2,085 carcases. The new suction manifold is fitted with an ingenious internal device that ensures equal distribution of the return gas to each cylinder. Effective straining of the return ammonia gas and lubricated oil whilst in circulation has been very carefully studied, and new strainers of the multi-cell type have been incorporated. The cooling of the refrigerated chambers is effected by means of air circulation through brine. The brine evaporator is of the submerged type, the cold brine being pumped over a series of special plates with a 6 in. Pulsometer centrifugal pump. The cold air after passing through the brine is delivered into air ducts into the chambers. The fans for the air circulation are fitted with variable speed three-phase reversible A.C. Commutation motors, supplied by the British Thomson Houston Co., and the flow of air into the chambers is reversed every hour, thus ensuring that all carcases are evenly chilled.

MERSEY TUNNEL PROGRESS.

The Mersey Tunnel Joint Committee held a meeting on May 3rd, when the engineers reported that the estimated value of the work accomplished to date is £526,023, the contracted cost as now contemplated being £718,079. Just over 97 per cent. of the distance between the quay walls of Liverpool and Birkenhead on the upper river heading has been driven. Excavation has been started on the old Haymarket line in Brunswick Street for a short section of full-sized 44 ft. inverted tunnel. On the Birkenhead side, the heading on the line to Albion Street is near the south-west corner of Hamilton Square, and has passed over the tunnel of the Mersey Railway Company. The heading on the line to Rendel Street is now passing underneath the Joint Goods Railway. The second shaft at Birkenhead, which is being sunk in preparation for the second contract, is practically complete.

FLEETWOOD FERRY IMPROVEMENTS.

When a recommendation from the Ferry Committee that instructions should be issued to the surveyor to prepare a comprehensive scheme for alterations and improvements to the ferry at the Fleetwood side of the river, was submitted for approval to Fleetwood Council, it was explained that there was no possibility of the scheme being carried through in time for this year's holiday season.

A BIG FLARE-UP.

To test the efficiency of the dry fire extinguishers manufactured by "Total" (Overseas) Ltd., 58, Victoria Street, London, the Mersey Docks and Harbour Board arranged for trials to be carried out on land near Seacombe Ferry. Those present included representatives of marine insurance companies, underwriters, warehouse and factory owners, and the chiefs of the Merseyside police and fire brigades. For the tests a large wooden hut was saturated with tar, petrol and oil, and then ignited; a 30 ft. high hoarding was similarly treated, as were also a pit 30 ft. by 20 ft., a large tank, a disused boat, a pyramid of barrels, and an 18 ft. wooden chimney. As the flames leapt high after each ignition, the extinguisher manipulators gave most effective and convincing demonstrations. The extinguishers consist of a canister, partly filled with sodium bicarbonate powder with a centrally filed cylinder containing carbon dioxide. The operators approached within a few feet of the flames, which were, in from twenty to sixty seconds, according to the density of the fire, completely subdued. The smaller extinguishers are somewhat similar to the familiar hand extincteurs, while for the more important tests, larger machines on wheels were utilised. The cloud of powder and spray emitted at high pressure appeared to blanket the fire and shut off the supply of atmospheric oxygen.

TRAFFIC RETURNS.

The monthly statistical summary of the Mersey Docks and Harbour Board applying to the month of March shows that foreign import cargoes which arrived at Liverpool and Birkenhead amounted to 577,517 tons. The method of disposal was as follows:—By cart, lorry or motor lorry, 299,100 tons; by road motor transport to outside districts, 35,214 tons; by overside delivery (grain and other cargo), 191,904 tons; by flat and barge ex-quay, 16,985 tons; by railway wagons loaded on dock estate, 21,858; bulk molasses pumped direct, 12,456. The distribution of the cargoes to local destinations may be summed up thus:—Of the gross tonnage, 495,119 tons, or 85.7 per cent. was cleared from berths with railway facilities, and 82,398 or 14.3 per cent. from berths without railway facilities; to local warehouses, factories and mills, 439,186 tons or 76.1 per cent.; to railway stations, 45,318 or 7.9 per cent.; to foreign and coastal berths, 22,918 or 3.9 per cent.; to canal depots, 2,390 or 0.4 per cent.; to canals and Upper Mersey, 26,445 or 4.6 per cent.; to other destinations, 41,183 tons or 7.1 per cent.

FLEETWOOD HARBOUR SCHEME.

Sir Josiah Stamp, president of the L.M.S. Railway Company, paid a visit recently to Fleetwood to inspect the harbour, its approaches and accommodation, as well as to study the scheme for the extension at Wyre Dock, Fleetwood, at a cost of £100,000.

Institute of Transport Congress.

Dock Problems discussed at Liverpool.

Only on rare occasions are the various aspects of land and sea transport so closely linked up with the work of managing and administering the services of a great port, as they were at the seventh annual congress of the Institute of Transport, held at Liverpool, May 17-19. There was an attendance of between 300 and 400 transport chiefs drawn from all parts of the United Kingdom, and included in the number was a strong representation of port, dock and harbour authorities. Their attention was commanded at the outset by a very informative and intriguingly interesting paper by Mr. L. A. P. Warner, C.B.E., General Manager of the Mersey Docks and Harbour Board. By outlining the system of administration and the policy of management, he was able to clearly indicate in what respects the conduct of the Port of Liverpool differed from practically every other port in the country. Members of the Institute could not refrain from the temptation to make comparisons with railway-owned ports, whilst Liverpool traders genially twitted Mr. Warner on the question of master porterage. This service is controlled by the Dock Board which issues licenses and regulates the charges for this service.

So much had been heard of Gladstone Dock, that Members of the Congress readily availed themselves of the opportunity of a tour of inspection. They made an extensive peregrination, witnessed the building of the new sheds (for the Australian steamers), the preparation of new sites for sheds, pile driving, pumping plant, dock appliances, methods of handling cargo, etc., all of which to describe in detail would take several pages. The time spent at the Gladstone Dock was too limited to see all there was to be seen, but as the White Star Line had invited the Members to tea on the liner "Cedric," they had to resist temptation to linger. Members of the Institute who are attached to dock and harbour authorities were certainly fascinated by the wonderful equipment of the Gladstone Dock, to which we shall probably make reference in subsequent issues of *The Dock and Harbour Authority*.

The Lord Mayor of Liverpool gave a civic welcome to the Congress and entertained the delegates at a reception at the Liverpool Town Hall.

"The Mersey Dock Estate; its Managers and Principal Traders," was the subject of the paper read by Mr. L. A. P. Warner, C.B.E., General Manager and Secretary, Mersey Docks and Harbour Board.

The most interesting feature of the old history of the Port of Liverpool, he said, was the fact that the merchants and shipowners of the town in the reign of Queen Anne conceived the possibility, and having conceived it actually carried into effect, the building of an enclosed dock, defying the weather and tides and providing a safe anchorage for their ships. With the building of this dock, came into being the first trusteeship of the docks, and the miles of docks now to be seen on both sides of the River Mersey. Nearly two centuries ago it was realised that dock management must be specialised and not confused with the ordinary affairs of a Corporation. Continuity of policy is essential and local consideration must not outweigh general principles affecting large masses of population, many of whom are far removed from the actual port.

The Dock Commmittee appointed by the Liverpool Corporation continued to act until 1858, roughly 100 years, when it was replaced by the body now known as the Mersey Docks and Harbour Board.

The next really big jump in dock construction took place with the advent of the railways which brought all the surrounding towns of Lancashire and Yorkshire into close and speedy communication with the port and enabled those towns to expand and consume the raw material imported from overseas for the various factories which sprang up all round the coalfields. Another very important factor about this time was the introduction of steam ships. From this period Liverpool and Birkenhead have continued to grow until the estate under the control of the M.D.H.B. has assumed its present large area and equipment, comprising 655¼ acres of enclosed water; 38½ miles of lineal quays; 1,443,530 square yards, or approximately 300 acres of transit sheds; 22 coaling hoists and cranes—capacity 300 tons per hour per machine; 11 hydraulic pumping machines; 5 impounding stations; 5 electric sub-stations (N.B.—Electricity received from Corporation); 11 river entrances; 18 dry docks; warehousing for 190,000 casks of tobacco, 47,000 tons of grain, 150,000 bales of wool, 80,000 tons of general goods (N.B.—The Board does not compete with outside warehouses but rather provides special accommodation for commodities requiring the same); lairages with covered acccommodation for 6,771 oxen, 22,000 sheep; 3 dockyards for the Engineer; 1 buoy store for the Marine Department; 3 floating stages; railway passenger station; 2 Customs baggage rooms; covered accommodation for 6,000 coastal passengers; 2 jetties for discharge of oil; and 112 miles railway lines.

Touching on the question of management, Mr. Warner said that he could say without fear of contradiction, and also without presumption, that the method adopted many years ago, and which still continues, is an exceedingly good one, as it provides for one executive head, with a personal staff of committee clerks, responsible for seeing that the orders and wishes of the committee are passed on to the respective departments for execution. At the same time, all the members of the Board are kept au fait, by a weekly meeting of the Board with what has transpired at the Committee Meetings during the previous week. As a good many of his listeners might know, he came to the Board from the L. & N.W. Railway, where they thought they were pretty good at turning up old records at Euston, but he was and still is, frankly astonished at the speed with which the internal system of keeping records at the head office of the Board, enables information of what has happened years ago to be produced in a very few minutes. It is true the system is expensive, but it really does work and saves much valuable time when questions suddenly crop up, as they have a habit of doing, in a most unexpected manner. The system in brief, consists of elaborate cross indexing, and what is called a worked up paper, the latter being a precis of each important subject, kept up to date as any new feature occurs, together with a cross reference to particular papers or committee proceedings. So much for internal management. The aim is to give the best facilities at the cheapest cost combining efficiency with economy.

Liverpool is perhaps, more essentially a liner port, and as such, the turn round of ships is a most important factor. For this reason, the rapid clearance of goods from the quays to make way for a succeeding ship is most important. There is no doubt that the more labour aiding devices which are provided on the dock quays, the more use we can get out of our expensive docks. Talking of quays and turn round of ships brings me to the question of Master Porterage, a system which does not obtain anywhere else that I know of, and which has been much discussed from time to time. It seems to me that men who specialise in the handling of cargo and who work under the control, though not as the servants of, a Dock Board and who are in competition with each other, as regards efficiency, but whose remuneration for work done is controlled by observations taken from time to time on the cost of doing such work, must be able to do the work better in the long run, than would be the case if all the dock labour were under one control and non-competitive. Opinions differ tremendously on this subject, and I can only judge for myself and by comparison of similar costs on similar articles at other ports, which, by the way are very hard to compare, as each port has its own customs.

About 79 per cent. of our Revenue is derived from dues on ships and goods, the remainder from rents of property and other small items. An interesting figure is the cost per ton paid to the Board on cargo passing through the port which works out to about 3s. 8d. In this amount I have included the dues on ships and goods. It is not an alarming figure when we consider the value given for it, in the shape of docks and quays and handling appliances. It must be rememberd too, that Liverpool has no other body to fall back upon from whom it can obtain a grant in aid, as some others have. It must make both ends meet on each current year's working. Cranes for heavy lifts in the old days were nearly all fixed cranes to which the ship had to go; nowadays the reverse is the order. The floating cranes take the heavy lifts alongside the ship, thereby saving the ship much expense, and also minimising the movements of a large vesssel in docks, which is always a great asset from the steamship owners point of view.

Dock entrances had grown and had altered in shape with the varying designs of ships. The older entrances are at right angles to the tide. With the greater knowledge obtained in manœuvring, the entrances have been more and more angled, until with the Gladstone Entrance you find it is practically parallel to the tide. Gladstone Dock has been so frequently described that it is almost plagarism to attempt it again. Its main feature is depth of entrance sill which enables a ship drawing 28-ft., to enter at almost any state of the tide, and this with a 30 ft. rise and fall is a great asset. Gladstone Dock is connected with the rest of the system by a lock into Hornby Dock. The chart of Liverpool Bay shows the entrance channel to the Port from the bar light with 25 red conical buoys on the starboard side and 23 black boat beacons on the port side. All the beacons and the more important buoys carry their lights 30 ft. above water so as to be readily visible from the bridge of a large ship. In addition to the buoys there are three lightships at important points, the most important of which is the bar. The Board also own and control four lighthouses, Point Lynas, Ormeshead Rock and North Wall,—the former being about 52 miles distant and is the only manned lighthouse. In the Liverpool Bay Harbour is a revetment built to guide and stabilise the channel. The lengthening of the revetment was comtemplated. Another training wall is now being built on the opposite side of the channel, and when complete it is hoped it will enable the scour of the tide to automatically do a great deal of dredging. Many experiments have been carried out on a large scale model of the bay which reproduces the tides and movement of sand as caused or altered by training walls placed in various positions, and it is with the help of this model that the staffs are learning every day new features in the art of training tides.

The Board is also the Pilotage Authority and own four fine steam pilot boats which maintain a very efficient service.

DISCUSSION TOPICS.

Mr. H. Hopperton, the General Manager of the Ardrossan Harbour Company, opened the discussion. The Dock Board had played a very important part in the life of the nation. It brought to mind the statue of Columbus in Sefton Park, Liverpool, on which appeared the inscription "Columbus, the discoverer of America and the maker of Liverpool." That was no doubt true in a poetic sense, but the real makers of Liverpool were the Mersey Docks and Harbour Board. The new docks had made a tremendous contribution to the resources of the Empire. What made Mr. Warner's paper so interesting was the outline it gave of the management policy of the Dock Board. That management had always been an inspiration to younger men in industry. He asked whether the ports within the ports, places like Garston, contributed to conservancy, dredging, etc., for work from which they derived an incidental benefit. It had been said that the Mersey Dock and Harbour Board made no "bargains" with private traders. He felt sure that Mr. Warner did not intend to convey the impression that the Board was devoid of commercial instinct. Mr. Hopperton added that he thought the Dock Board tempered the wind to the shorn lamb, perhaps not in the case of individual traders, but to individual trades.

Mr. R. J. Hall, Chairman Mersey Wharfage Co., said that any discussion on the Mersey Docks and Harbour Board always attracted a certain amount of attention, even in Liverpool. He recalled that the City Council was dispossessed of the Dock Estate because it was making a profit. That was surely a good thing. The City Council were accused of devoting the profits they made to the reduction of local rates, but it deserved to be noted that the compensation which the Corporation received from the Dock Estate was contributed mainly to the erection of St Georges Hall. In a reference to master porterage, Mr. Warner had said that Liverpool was the only port in the kingdom where the same system prevailed. Naturally Mr. Warner believed in it, but he thought Mr. Warner was the only man in Liverpool who did. It would be very difficult for Mr. Warner to persuade those who had to pay master porterage that it was a good system. He was interested to read a short time ago the duties of a master porter, but many more could be enumerated. He believed that Mr. Warner, if given a free hand, could evolve an infinitely better system of master porterage than that which existed to-day. The Gladstone Dock represented a new era in dock construction. When they looked at the entrance to the dock, capable of docking vessels up to 28 ft. draft at any state of the tide, they felt that it was a wonderful achievement as far as dock construction on Merseyside was concerned. Liverpool had another peculiarity a weakness and yet it was a source of strength. The City Council, although no longer responsible for the Docks Estate, was not unmindful of it. They were helping to finance the new East Lancashire road which would link up with the Mersey Dock Estate in the matter of road and rail transport. He had no hesitation in saying that the whole of the trade of Manchester could be dealt with on the Dock Estate of Liverpool without the expenditure of a farthing capital. Liverpool was free from railway control, but that had certain disabilities in competing with railway-owned ports, where port services were provided at less than actual cost. What the railway companies lost on the swings they made up on the roundabouts. The railway dock with its goods station facilities quoted station to station rates. Through rates from railway-owned docks required very close examination in the light of conditions to-day.

Mr. A. H. Roberts, O.B.E., Superintendent and Engineer, Leith Docks and Harbour Board, said that the Mersey Docks and Harbour Board provided an excellent illustration of the management and development of a port. It was often overlooked that the ports were the gateways of the nation and not mere local feeders for a town and neighbourhood, nor for the railway companies. This country was dependent upon its imports and exports and the real raison d'etre of a port was to import and export cargoes. If the total tonnage were divided into the net cost of running the port, one was immediately provided with an index figure, on which some reliance could be placed, and which would enable remarkably accurate forecasts to be made of requirements. Some ports would be astonished if they knew that traffic was costing 3s. 8d. per ton. In Liverpool, where very large quantities of the same material were handled in the same form, it was possible to instal appliances which could be operated mechanically and were of great value in keeping handling charges down. Where there was a great variety of consignments there was not the same scope for the operation of this plant. Some five or six years ago a paper was read before the Institute in which the advantages of electric trucks were pointed out. Even in those days it was stated that these handy vehicles were certain to come into their own. In nearly all ports, electric trucks were now being regularly used. Mr. Roberts went on to refer to particular types of dock entrances and dock sizes. There was a financial reason for the steady increase in the size of ships, because they enabled cargo to be carried in mass, at a rate which worked out cheaper per ton from start to finish, but there were limits which had to be recognised. There was not an unrestricted quantity of cargo available. The Mersey Docks and Harbour Board was to be congratulated upon having built works so much in advance of visible requirements. Many ports were feeling very keenly, the effect of competition with railway-owned ports. The private undertaking was in an entirely different category as they had their own dock expenses to meet. Too often, transport undertakings were regarded as individual or solus interests. Co-ordination was required and the best method of realising this, he thought, was by recognising that transport was a national industry, and was one of the essential assets of our national life.

Mr. W. H. Gaunt, O.B.E., Vice-President and Distribution Manager J. Lyons and Co., Ltd., said that Liverpool had "saved its bacon" in many respects by motor haulage. His impression was that before motor haulage came on the scene, Liverpool, although an excellent port, was being strangled by the railways. There had been a great deal of water frontage unserved by railway sidings, so that a portion of the estate was becoming out-of-date through not being suited to traffic requirements. Motor haulage had restored many of the docks to competition with other dock systems. He looked upon master porterage as having something of a strangle hold on Liverpool. He wondered if the Mersey Docks and Harbour Board had their time to go over again, whether they would not simply provide the labour and leave master porterage to be carried out by unfettered private enterprise, as was done in neighbouring cities.

Mr. S. L. Jude, Secretary of the Shipping and Forwarding Agents Association, referred to the value of the great publicity work which had been undertaken by the Mersey Docks and Harbour Board, not only in this country but abroad. The great form of publicity that the Dock Board could undertake would be to make it known throughout the world that at Liverpool, traders could depend upon fair rates and efficient service. That was much more preferable to low rates and inefficient service. Far too many people thought more of the saving of a penny a ton than of good service. Mr. Jude also referred to the publicity which Liverpool had received in other ports.

Mr. H. A. Watson, C.B.E., M.V.O., Ex-General Superintendent London and North Eastern Railway Company said Liverpool was fortunate in the public spiritedness of its citizens, especially in connection with the management of the port. It was excellent that there should be so many busy men willing to hold office and to serve the port to the best of their ability. The organisation of the Mersey Docks and Harbour Board had a great deal to do with its success as a harbour authority. One could not help contrasting the point of view of the railway official responsible for working dock traffic with that of the independent official acting for an authority like the Mersey Docks and Harbour Board. The railway-owned dock was practically a goods station. Apparently the question of master porterage was a very vexed one in the port of Liverpool, but there was need for more information on the merits or demerits of the existing system. It might even justify a request being made that Mr. Warner should address a meeting of the Institute and go into all side issues of the subject. It was difficult to generalise on master porterage as so many considerations were involved. He thought it was a mistake of any person to try to do the work belonging to others who were specially trained for it, and it was from that standpoint that they should regard the question of a dock authority doing its own work or letting it out. The matter was one which, he suggested, deserved looking into. In a reference to crane appliances, Mr. Watson said that the difficulty was to get this equipment as mobile as the user would like it. He believed that it was not an easy matter to get really mobile land cranes, but there were floating cranes available of upwards of 80 tons capacity.

Mr. W. A. M'Grath, General Manager and Secretary Rochdale Canal Company, remarked that northern people were proud of the Port of Liverpool which received 80 per cent. of the 3,500,000 bales of cotton received into this country annually. In 1888, Liverpool dock dues were paid on 9,000,000 tons of goods; in 1927 dues were paid on 20,750,000 tons. This greatly increased tonnage was conveyed in 3,649 fewer vessels than the 9,000,000 tons. That showed a great increase in the size of the vessels travelling to and from the port. The policy of foresight and looking ahead was well interpreted by officials of the Dock Board. The Port of Liverpool was able to guarantee the owners of ocean-going vessels, a regular weekly service to the North American ports, by enabling a complete turnround in five and a half days.

Major F. Bastard, O.B.E., Passenger Traffic Manager, White Star Line, said that passenger-carrying interests of Liverpool were greater than all the questions that might arise in regard to master porterage. Reference had been made to the loss of passenger traffic to Liverpool, but not too much importance should be given to that. It was true that Liverpool had lost the highly decorative de luxe American passenger traffic, but it retained the highly important overseas passenger trade, still carried the bulk of the cabin passenger traffic, by far the bulk of the new tourist traffic, and the bulk of emigration traffic. Liverpool was also well situated as a home port, with ports of call, Greenock, Belfast, Moville and Queenstown, all of which could be taken en route. There was also the very

important cross-channel and holiday passenger traffic in Liverpool. He hoped those present would be able to visit the landing stage which was one of the finest assets of the Mersey Docks and Harbour Board. Gladstone Dock was not adapted for handling passenger traffic. This came through to the landing stage. The success of Liverpool as a port, was due to the fast that it was a combination port where were merged the passenger and freight interests.

Mr. L. A. P. Warner replied to the discussion and mentioned that the Dock Board was now just finishing a new entrance to one of the Birkenhead docks which had been deepened so that vessels leaving Birkenhead for the Suez Canal could be loaded deeper than was formerly the case. One of the speakers had called his attention to motor haulage and the interests of the Dock Board in it. He thought it was well known that the Dock Board had contributed £100,000 to the new East Lancashire road as evidence of its faith in motor haulage. The Dock Board was a trust and tried to treat everybody alike. If the Board made a bargain with one man, it applied to others. He could not understand Mr. Hall's arguments regarding master porterage, because Mr. Hall was one of those much maligned master porters. It was to the public spirit of Liverpool men that the success of the Port of Liverpool was due. The White Star Line was now using Gladstone Dock and they were able to work their ships several hours longer than they could when they berthed in one of the older docks. Liners were now able to leave Gladstone Dock and without anchoring in the River Mersey, were able to go straight alongside the landing stage, then away to sea.

LIVERPOOL ROAD TRAFFIC REQUIREMENTS.

"A Survey of Liverpool's Road Traffic Requirements," was the title of a paper by Mr. J. A. Brodie, P.P.Inst.C.E., M.I.Mech.E.

Liverpool, he said, had a river frontage of approximately seven miles, wholly absorbed by the docks and quays. The space immediately behind the Dock Estate is for the most part at a level not much higher than that of the dock quays and so provides suitable sites for the warehouses in which a considerable proportion of the merchandise reaching the port is stored for a shorter or longer period. A broad road, referred to as the Dock Road, outside the dock boundary wall, flanks the Dock Estate for its whole length, providing the means of road communication between the several dock quays themselves and between those quays and the town warehouses situated in streets leading off the Dock Road. At many points immediately adjoining the docks the railway companies have provided large terminal goods stations and collecting depots, in many cases having attached to them extensive warehouses. A line of railway belonging to the dock authority runs along the whole length of the line of docks, having branches to the several quays and junctions with the stations, so that goods, intended for transport by railway, can be expeditiously passed between the dock quays and the railway companies' main systems. Several canal companies also have important depots in positions convenient for the collection and distribution of goods carried on their systems. The docks at Birkenhead, on the Cheshire side of the river, form an important integral part of the Mersey Docks and Harbour Board's system. At present, the method of transporting goods across the river is by complete cargoes in small river craft or by the goods ferry steamers of the Birkenhead and Wallasey Corporations, which carry on their decks all classes of wheeled traffic, hand, horse and motor. Before the advent of the motor wagon, many attempts had been made to find a satisfactory solution of the difficulties connected with quick and cheap transport of raw materials and manufactured goods between the ship's side at Liverpool and the factory or works in the manufacturing districts at some distance from the port.

With the object of investigating and developing this class of traffic, an Association called the Liverpool Self-Propelled Traffic Association was formed and a gold medal and £1,000 in prizes were offered by Liverpool men for competition about the years 1898-1900. It was not until the year 1913 that heavy traffic into and out of Liverpool had increased to such an extent as to cause anxiety on the part of the highway authorities. The figures for tonnage of road traffic passing into and out of Liverpool are as follows:—

Year.	Gross Tonnage.
1913	884,208
1920	4,816,656
1921	6,052,496
1922	9,576,216
1923	9,627,696
1924	9,694,152
1925	11,714,352
1926	13,282,776
1927	15,201,576

From the Cheshire side there had also been a quickly increasing number of vehicles as shown by the following returns:—

Year ended March 31st	Birkenhead	Wallasey	Total
1920	392,365	213,449	605,814
1921	422,883	210,939	633,822
1922	410,334	230,991	641,325
1923	502,178	242,880	745,058
1924	572,302	273,523	845,825
1925	632,233	283,647	915,880
1926	698,922	293,603	992,525
1927	797,998	314,279	1,112,277

Certain very interesting facts issue from a consideration of these returns and others taken on the same basis at other important traffic points within the City. There has been practically no increase in traffic along the Dock Road where the heavy traffic very largely remains of the 2 horse lorry type, carrying very heavy loads such as existed before the introduction of motor wagons. The average speed of these vehicles which occupy so much of the road surface remains at about 2½ miles per hour and it is found that as a rule the faster travelling motor wagons use the Dock Road as little as possible, as they cannot get along at higher speeds than the horse-drawn vehicles owing to congestion. On a parallel street where the proportion of heavy horse traffic is not so great as on the Dock Road and where the motor wagons can average some 10 miles per hour, the tonnage using the street has increased three fold. Many motor vehicles passing from the line of the Dock Road up into the parallel road and again pass down to their destination, if, as will frequently be the case, that lies in the space between the longitudinal streets or on the Dock Estate, westwards of Dock Road.

There cannot be any question of the great benefit accruing from the quick delivery of manufactured goods to the ship's side from the factory, and the like despatch of raw materials into the factory from Liverpool warehouses or quay, and that this can be done profitably the great increase of traffic appears to indicate.

The City of Liverpool has for many years treated with the attention it deserves, the question of the improvement of existing streets and the laying out of improved routes to meet the needs of increasing population and moving merchandise. Having regard to the large town area near the docks having no steep inclines, the loads of goods carried on the heavy horse lorries in Liverpool have been heavier than those in most other towns. The question of improved road communication with the manufacturing districts of Lancashire has been a foremost one in the consideration of prominent citizens for years as has also that of a roadway tunnel under the Mersey at Liverpool.

In 1925, Parliamentary powers were obtained for a roadway tunnel, 44 feet in diameter, between Liverpool and Birkenhead, and, as soon as practicable, work was put in hand and carried on vigorously in the form of two headings one above the other proceeding simultaneously from both sides of the river. On the 3rd April last one of the two headings was "holed through" by the Chairman of the Tunnel Joint Committee.

As regards the East Lancashire Traffic Arterial Road, many years have passed since its construction was first proposed. About the year 1910, when serving as a member of the Road Board Advisory Committee on Roads, Mr. Brodie was asked by the then Chairman of the Road Board—the late Sir George Gibb—to consider and advise the Board as to any new roads in the Lancashire district which could be considered as of national importance and on which the accumulated funds of the Road Board could advantageously be applied as a work for the unemployed in the event of such a necessity arising. He made two suggestions. The first was the construction of a new wide transport road leading from the Port of Liverpool in the direction of Manchester and the second one from Liverpool in a northerly direction to Southport and continuing parallel to the River Ribble on its southerly side to Preston and East Lancashire.

As at first proposed, it was intended that this road should terminate in Manchester or Salford, but, owing to the determined and continuous opposition of Manchester, a change in direction was decided on by the Ministry of Transport, and the direction of the easterly end of the road was changed so that it would provide a suitable lead for a continuation at some time in the future over the hills into Yorkshire, and thus provide a thoroughfare to and from the manufacturing districts of Yorkshire. The Lancashire line of this road has recently been set out and a start made on its construction in the outskirts of the City of Liverpool.

When this road has been completed it should be possible to get two return loads per day between Liverpool and most of the Lancashire manufacturing towns as against the present general practice of one return load and it will then also be possible more fully to appreciate the advantages of speed on up-to-date motor ways.

Liverpool is fortunate in having a series of fairly wide distributing roads leading from the line of the new road within the City down to the docks at distances of approximately one mile apart so that, with the exception of the one main road itself down to the end of the new tunnel, no very heavy expenditure will be necessary on these streets.

The new Mersey Roadway Tunnel, accommodating amply four lines of traffic, is so designed as to form a continuation of the new Lancashire Traffic Road to Birkenhead Town and

Docks and Cheshire generally. Its main entrance in Liverpool will be at the Old Haymarket. A second entrance is through a branch tunnel leading northward directly to the line of docks. At Birkenhead there will also be two entrances, one for the through traffic coming from the direction of Chester, the other near the Birkenhead docks.

The present cross river traffic from Cheshire to Liverpool, though carried on under difficult conditions as to tides and unavoidable delays such as fogs, is rapidly increasing by an average of some 100,000 vehicles annually. As soon as the new roadway tunnel is opened it will induce a very large amount of traffic to come up from the Potteries and the Birmingham direction to Birkenhead passing through the tunnel to Liverpool. Cheshire County is doing good work for existing traffic in opening out and widening the main Birkenhead to Chester road and there is little doubt that a trunk road will ultimately be necessary through to the Potteries and on to Birmingham.

Another road, which though it may be longer delayed is bound to come, is one across the mouth of the River Dee from Hoylake to some point near Rhyl by way of Hilbre Island. Such a scheme is of course no novelty. The fruition of such schemes takes time but a combination of interests on this route so that both railway and road traffic could pass across Lancashire, through Liverpool, under the Mersey and across the River Dee joining up to the roadway and railway running down the Welsh coast would appear to have great advantages and now to be well within the probabilities of the future. There can also be little doubt that the increasing traffic will ultimately force the widening, straightening and general improvement of the direct road through Preston. Much has already been done in this direction when nearing Preston. but the Liverpool end, where the greatest amount of traffic exists, shows little sign of being handled on an adequate scale or other improvement except in the matter of surface. Dangerous turns and corners are abundant in this length. A better road approximately parallel to the Lancashire shore of the Mersey Estuary leading out from the south end of Liverpool through Widnes and Warrington will also be required before Liverpool can be considered as reasonably provided with suitable approach roads.

PROBLEM OF PASSENGER TRANSPORT.

In the discussion which followed, most of the speakers concentrated on a question of passenger transportation. In view of the heavy traffic using the dock area of Liverpool, Mr. Brodie was asked to give some information as to the materials best suited for road construction.

The advantages of good road surfaces, he said, were not properly understood in many places. Many of the Liverpool roads were paved with stone setts from Penmaenmawr and North Wales and although the first cost was heavy, they provided one of the best surfaces it was possible to have. He had put down some of these setts 30 years ago, and during the time which had elapsed, he did not think they had cost sixpence per superficial yard. There were two streets not far away from that meeting place, which were laid with North Wales stone over 50 years ago and had taken heavy loads which hardly incurred any maintenance cost. It was not unusual to have loads of over 100 tons on four wheels passing over the streets of Liverpool, without known damage to paved streets.

Major-General S. S. Long said there was need of co-ordination and a free and frank discussion between the railway and the road transport interests. Perhaps the President of the Institute of Transport would consider taking the initiative in bringing about such a conference.

Mr. T. Pierson Frank (City Engineer, Liverpool Corporation) said that much of the traffic along the dock road was from the line of warehouses immediately adjacent. Probably some degree of alleviation of the congestion might be given if aerial railways could be established between certain points. The increase in traffic along the dock road had been fully maintained during the past year; if anything, the figures quoted by Mr. Brodie under-estimated rather than over-estimated the volume of traffic. Work had been commenced on the new South West Lancashire road, which would feed the Mersey Tunnel, and it was expected that the local section of this important highway would be completed within the next twelve months.

Mr. W. H. Gaunt, O.B.E., said that nowhere were there more steam lorries in use in proportion to general traffic, than in Liverpool and Lewes, and he was afraid that this would have a deteriorating effect on the traffic possibilities of the Mersey Tunnel, as had been the case in London. What steps were being taken to prevent air pollution in the Mersey Tunnel? Would the Tunnel be toll free?

Mr. W. Brodie (Liverpool) said the lesson to be learnt from the past was to prepare for the future by employing the best engineering ideas. Boldness and foresight should be exercised.

Replying to the discussion, Mr. J. A. Brodie said that the ventilation of the Mersey Tunnel need cause no one uneasiness as exceptional measures had been taken. Powerful fans working at great pressure would draw in sufficient quantities of fresh air, and exhaust fans would take the foul air upward and along ducts to the discharge outlet. Tolls would be levied on the Mersey Tunnel for 20 years,

OCEAN TRANSPORT IN INTERNATIONAL TRADE.

Particular interest was taken in the paper by Sir Norman Hill on " Ocean Transport in International Trade " in the course of which he touched on port and harbourage problems. Transport agents, he said, might be inclined to doubt whether the world believes in international trade, yet nations practising the most extreme forms of protection are as insistent as the nations which open most freely their markets to the trade of the world, on the need for safe, frequent and cheap transport both by sea and land. To that end they build and develop ports and their land communications; and some of the nations practising the most extreme forms of protection have thought it necessary to build and run ships of their own in the hope thereby of securing cheaper ocean transport. There is a need of a clear perception of what the services that ocean transport can render, and incidently of the conditions under which such services can be most efficiently performed.

The volume of the international trade of the world is, in very great measure, limited by the carrying power of the shipping available under all flags, as probably, in value, something like four-fifths of the total in seaborne as against one-fifth that is carried across land frontiers. In weight the proportion that is seaborne is probably even greater. The carrying power of the shipping is limited, both by the cargo holding capacity of the ships, and by the number of times that capacity is used within any given degree on the time occupied in the loading and discharging of the cargoes carried; but above all else on the ship being able to secure a return cargo. Ocean transport must be limited and costly if there are delays in the ports, and it must be very limited and very costly if there is cargo to be carried only one way.

Roughly a ship will, on the average, spend about half of its life at sea, and the other half in port. The change from sail to steam has reduced very substantially—possibly by as much as three-fourths—the time occupied by the voyage itself. The corresponding introduction of mechanical appliances has reduced to an even greater extent the time needed for loading and discharging of cargoes, and their distribution and collection at and from the ports. But the sum and total of the carrying power of the ships is limited and controlled, first, by the traffic provided, and secondly, by the rate at which that traffic flows from the original producer to the ultimate consumer. Provision can be, and is made for the holding up of some of such traffic for a time, in store and warehouse, on the railways, in the ports, and even in the holds of the ships; but on the route, holding up capacity is everywhere strictly limited; and if it is anywhere over-burdened, blocks result and carrying power is lost.

The services that Ocean Transport can render are limited and controlled by the flow of trade. The ships, ports and railways, each up to their capacity, can handle such traffic as is given to them, but they cannot create it or dispose of it. It is of primary importance that the facilities they offer should be used both ways, and for the purposes of transport only.

Whilst the sea is free to all, its use for the purposes of ocean transport can be controlled, through the ports to be served, not by one, but at least two nations. That control may be regulated as between nations by treaty which guarantees to the ships under both flags and their cargoes equal treatment, or it may be exercised with the object of promoting the political or economic interests of one, or the other, or of both the nations to which the ports belong.

If no control is exercised as between flag and flag, and the ports are left as free as the sea, then, but only then, has the nation the advantage of the best of the world's ocean transport services. It is only under such conditions that it can secure the best of the ship carrying power that is available and at the freights that are current in the open freight market of the world.

Many changes have taken place within 50 years in the type of vessel built. Progress in increased carrying power, in economy in fuel consumption, and in the safety with which cargoes are carried has been continuous, and in addition entirely new types of vessels have been created. There is now afloat a fleet of vessels capable of carrying, on the longest ocean voyages, fresh meat, fruit and dairy produce. The introduction of this type of vessel has effected fundamental changes in the food supplies of many countries, and in doing so has brought into the markets of the world as buyers of manufactured goods, the producers of those supplies. Another development within the last 50 years is that of the " tanker " or vessel carrying oil in bulk.

Freights from London to Melbourne, a voyage of 11,900 miles, run from 50s. to 100s. a ton according to the class of cargo, whilst the freights from Melbourne to Adelaide, a voyage of 500 miles, are 15s. 6d., and from Melbourne to Port Pirie, a voyage of 700 miles, 38s. a ton. For purposes of comparison these rates are, per ton, per mile as follows:—London to Melbourne, .05d.—.10d.; Melbourne to Adelaide, .37d.; Melbourne to Port Pirie, .65d.

Cheapness is only one of the advantages afforded by the open freight market; the facilities it offers to traffic are of far greater importance. Regularity and frequency of service are a necessity to the development of international trade. The safety and care with which the cargoes are carried, and the condition in which they are delivered are of the first importance, and to

secure those advantages nothing has ever been found to equal the pressure of free and open competition amongst the shipowners of the world.

The protection that a nation can give to the ships under its own flag in international trade is very limited. It cannot look for, and of a certainty it will not get, better treatment for its ships in foreign ports than it is giving in its own ports to vessels sailing under the flags of those nations to which such ports belong. There is no trade in the world in which retaliation is simpler, and as history has shown more inevitable, than in the ocean-carrying trade.

Mr. J. R. Hobhouse (A. Holt and Co.) said there were many factors which tended to promote the mercantile marine of countries, and these included the scientific development of invention in engineering and shipbuilding, and the accessibility of shipbuilding materials.

Mr. F. Fletcher Hunt said the great duty of the transport industry was to give our ships the best possible equipment for despatch in handling cargoes and for safety and regularity in delivery.

Sir Norman Hill said it was obvious that by working ships in relation to exports there were advantages to be gained. For prosperity in international trade, an open freight market was essential.

INDUSTRIAL CO-OPERATION AS AN ECONOMIC FACTOR.

At the final session of the Congress, Sir Josiah Stamp, G.B.E., D.Sc., LL.D., presented a paper on "Industrial Co-operation as an Economic Factor."

The successful limits of democratisation of a business, he said, vary with the class of business, the nature of its management, and it may mean anything and everything, from benevolent paternalism on the part of the employers to sweeping usurpation on the part of the employees. It is not enough to say that the employees should have an adequate voice in the "determination and control of the conditions of work" for an adequate voice means quite different things at a given stage in a given industry. What is wanted, of course, is a process of education. But this is not education merely of the worker, it is also the education of the lower executive officer who has to realise that good ideas may come from the humblest worker and are more likely to come if encouraged, under judicious control, and with practice. He has to learn also that "man dressed in a little brief authority" does things "that make the angels weep." The lower executive is the man who has to stand the racket when ideas put forward by those whom he has to keep under discipline seem to be a criticism of his own past management and efficiency. It demands a great deal of grace and good humour on his part that are more difficult to cultivate even than fresh-mindedness and new knowledge. We cannot complain if workmen, as a mass, have not actually on the surface a large degree of managerial ability, because evolution of business has not so far made it necessary to evoke it. The real obstacle to successful democratisation can perhaps be summarised in ignorance of employees, and secondly, the ignorance of employers, and by a man's ignorance, I do not mean so much that he does not know, as I do the worst kind of ignorance—that he does not know that he does not know! Thus co-operation should aim at harnessing brains, as well as muscles, and so secure the maximum of effort of men and officers in dealing with the problems that arise from day to day.

The general principles of the London Midland and Scottish Railway Company's co-operation experiment were expounded at a series of meetings held in 22 different areas, attended by headquarters and local officers of the Company, including those in regular direct contact with the staff, and representatives of all ranks appointed by the men. At the joint conferences, officers of the Company submitted to the men full and frank statements as to:—

(1) The unsatisfactory position of the Company's traffic receipts; (2) the disappointing dividend returns in recent years; (3) the depleted condition of the Reserve Fund; (4) the serious depreciation in values of the Company's stocks, etc.; (5) the heavy annual cost to the Company of compensation for such things as goods lost and damaged; rolling stock damages; accidents to staff, etc. Some of the causes of these unsatisfactory features were explained; and in appealing to the men to assist in retrieving these misfortunes, in maintaining employment, and their existing good conditions of service, a number of methods by which they might give their aid were explained. They were urged—

(a) To use their influence in support of proposals designed to further the Company's interests as publicly prosecuted; (b) to use their influence with the religious, social, political, or other associations, and with their friends, in securing additional business; (c) to study the requirements of the Company's customers, and promptly respond to them; to exhibit courtesy and attention generally; (d) to exercise care in handling goods; (e) to practice economy in the use of time, stores, lighting, heating, etc.; (f) to safeguard the valuable tools and machinery supplied for carrying out their daily work; (g) to observe carefully the "Safety First" slogan, with a view to avoiding personal accidents, and needless waste of money on compensation.

During the first three months of 1928, there have been over 500 meetings of local committees at important stations for discussing local business matters. The significance of this is that the fewer meetings in the earlier years were held, generally, to consider grievances of the men, whilst in the present year the greater number of the meetings have been mainly concerned with the subject of co-operation, and the methods by which it can be made effective. It is encouraging to know that at these local conferences the men themselves have pointed out numerous ways in which the business may be more efficiently conducted.

When by care or forethought an economy is made in fuel or other auxiliary agent of production, the effect is as though the existing machinery or plant had been made more efficient or an improved machine had been introduced, with, however, this important distinction, that no capital expenditure is involved which has first to be remunerated, and a balance produced before the advantages of the innovation are felt. The bearing of this is that the financial results are not as differential as they are in the case of new machinery, between the concerns that can afford to introduce it and those that cannot, of the concerns whose machinery is ripe for renewal and those whose machinery is not. Now changes of this order obviously can find their final economic destination in one of three places according to circumstances:

(a) In the reduced price of the product or its improved quality; (b) in increased profits to capital; (c) in improved wages.

The actual fate of any given unit of economy in its final economic effect will depend upon:—

(1) Whether it is particular to a certain concern, or general to an industry; (2) whether the demands for the products of the industry are elastic or inelastic; (3) whether the industry is sub-normal in its results as regards profit or capital, and struggling to maintain a position against competing industries, i.e., Railways as against Road Transport; (4) whether a supply of new capital for improvements is or is not an important factor in maintaining the size of the industry; (5) its competitive power and therefore its ability to keep employed a given number of workers.

In conclusion, Sir Josiah said that the results of the co-operative movement in industry are the best illustration of the solidarity of industry under modern conditions, inasmuch as it is difficult to confine these benefits to any one section of the community.

BANQUET SPEECHES.

In the evening, the banquet was held at the Adelphi Hotel, under the chairmanship of Mr. Cecil Bentham (the Chairman of the North-Western Section).

The Right Hon. Sir Archibald Salvidge, P.C., J.P., claimed that the River Mersey was one of the finest commercial waterways of the world. Whatever rivalries might exist between the two great centres of Lancashire in industry and commerce, there should never be any jealousy or rivalry in matters of transport. Upon efficient transport system depended prosperity. Whatever particular branch of transport engaged attention, whether by land, by sea, or by air, members of the Institute were all the better for getting together in conference to discuss, with a view of solving problems by which they were confronted, and it was surprising what problems could arise in connection with transport.

Mr. Roger T. Smith, M.Inst.Mech.E., acknowledged the toast and thanked Sir Archibald Salvidge for the way in which he had dealt with the philosophy and principles of transport. Liverpool had many fine engineering works, but he believed the new Mersey Tunnel would overshadow everything else. All interested in transport would pay homage to that great work, which was one of the greatest of this age, and which, when completed, would be one of the wonders of engineering achievement. Transport was a great public service. He appealed to the people of Liverpool to support the Institute of Transport. At the present time it was rather one-sided and needed the support of the shipping and dock people from whom they had much to learn. He appealed to those sections of the transport industry, to join the Institute and to give the organisation the benefit of their vast experience.

Mr. Thos. Abbott proposed The Guests and made particular reference to the wonder of Gladstone Dock.

CASTING CONCRETE PILES.

"Firm Foundations" is the title of an illustrated brochure just issued by the British Steel Piling Co., Ltd., describing the Vibro system of casting concrete piles in situ. Typical contracts carried out on this principle are described and illustrated. Copies are obtainable from Ernest Ingram Hill, Ltd., 29, Ludgate Hill, E.C.

TRANSPORT APPOINTMENTS.

Messrs Vickers, Ltd., announce that the following gentlemen have been appointed directors of the Metropolitan Carriage Wagon and Finance Co., Ltd.:—Messrs. J. P. Crouch, R. C. Irwin, G. G. Sim, Howard William; and that Mr. T. L. Taylor (chairman and managing director of Taylor Bros. and Co., Ltd.) and Mr. Alexander Spencer (chairman of Spencer Moulton and Co.) have been appointed chairman and vice-chairman respectively.

Port of Hull.

HUMBER CONSERVANCY BOARD.

The Humber Conservancy Board was of age on April 24th, when the 21st annual meeting was held. Mr. J. H. Fisher, J.P. who presided, commented on the fact and remarked that looking back upon the twenty-one years' work he thought the members could congratulate themselves on what had been a great success following the various amalgamations of river interests from which the Board was formed.

A paragraph in the report had reference to the proposed training walls at Trent Falls. Both the Board of Trade and the Conservancy Board, it was stated, had recently accorded their statutory approval to plans and sections of the training walls which the Aire and Calder Navigation are authorised by the Aire and Calder Navigation Act, 1914, and the Trent Improvement Act, 1926, to construct at Trent Falls for the purpose of forming the tangential junction of the rivers Ouse and Trent. Under these statutes the Aire and Calder Navigation are required to complete the whole of the tangential junction within a period of eight years from the 15th July, 1926, and to maintain and light the same at all times, the Conservancy Board contributing a sum not exceeding £76,000 towards the cost of that part of the works which will be in the Humber and Trent—that is the Conservancy jurisdiction of the Board. The Chairman added that the Aire and Calder Navigation are now free to proceed with the whole of the work. Delay had been caused in the work at the Arlington new drain sluice, but it was hoped that by the next annual meeting these difficulties would have been overcome and that it would be possible to report that substantial progress had been made. The new lightship designated "Spoon" had been established and the "Middle" lightship dis-established and its place taken by a new light float fitted with bell and driven mechanically by the action of the tide.

FINANCIAL RECEIPTS.

Referring to the accounts, the Chairman said that the normal receipts on revenue account amounted to nearly £40,000 or £1,300 more than in 1926. The shipping dues, the Board's largest source of income amounted to £26,204, an increase of £1,728. The expenditure on revenue account was £46,427, an increase of £17,103, of which £16,665 was on the construction of the new "Spoon" lightship and the new "Middle" light flash. The normal expenditure was therefore £29,762, which was £438 higher than that of the proceeding year. The surplus of receipts on the year's working was £10,173, which he considered most satisfactory in view of the great depression in trade. In reply to Mr. Minnett Good, who asked when the first payment would have to be made to the Aire and Calder Navigation in respect of the new works, the Chairman said that it would not be made until next February, but he could not say exactly what the account would be. Mr. J. H. Fisher, J.P., was re-elected Chairman and Mr. Tom Sutcliffe, J.P., was re-elected Deputy-Chairman of the Board. Complimentary references to their devoted work and that of Mr. A. W. Franklin (Clerk to the Board) being made.

TRADERS AND DOCKS.

The shipowners and merchants of the Port of Hull are making an effort to bring pressure to bear on the London and North Eastern Railway Company to complete the Hull King George Dock (opened in June, 1914, by His Majesty the King) by the construction of an additional "arm" provided for in the original plan, which would bring the area of the Dock up to about 84 acres water space; and to carry out suggested improvements at the Victoria Dock for the better accommodation of the import timber trade and for the inter-changeability of rail traffic between the Victoria and Alexandra Docks by the utilisation of an intervening plot of land, known as the Western Reservation and owned by the Corporation. The Grain trade are desirous that the silo accommodation for the handling of grain at the King George Dock should be extended. At a meeting of the Hull Chamber of Commerce and Shipping on May 7th, these matters were under consideration and great disappointment was expressed that nothing yet had been done by the Railway Company in the directions stated. The strongest complaints were from the timber trade who have been hoping that negotiations between the L. & N.E.R. and the Hull Corporation with regard to the Water Reservation would result in an arrangement for its use by the railway authorities so that more bogie sidings and standage ground could be provided to relieve the congestion in the busy periods of the season. Mr. Minnett Good said that the Shipping Committee felt that the Baltic timber trade was being vitally prejudiced by the railway Company. If nothing were to be done with the Western Reservation, the L. & N.E.R. should state definitely that they did not intend to deal with it, instead of leaving the timber interests in a state of suspense. The utilisation of the Western Reservation which would also effect the linking up of the Victoria and Alexandra Docks, was a comparatively small item yet would give considerable additional accommodation and convenience and could be dealt with so quickly that he could not understand the indifference of the railway Company.

Speaking on behalf of the L. & N.E.R., Mr. R. L. Ferguson, Divisional Goods Manager, said that the question of the extension of the King George Dock was a "hardy annual," but to date the Directors had not discovered any justification for it. The L. & N.E.R. had gone into the matter at frequent intervals but it was not a sound financial proposition at the present time. Extension would involve an expenditure of half a million pounds. Could the traders show him any adequate returns on that capital? With regard to the grain silo, Mr. Ferguson said the L. & N.E.R. engineers were getting out plans and estimates; the Directors knew approximately the amount of trade which had been shut out and if it was sufficient to pay the interest on the capital expenditure that would be involved, he had no doubt that they would sanction the extensions; if it did not he could not hold out any hope. Continuing he said they had been asked by the timber trade to utilize the Western Reservation for a connecting line between the two Docks, and to provide storage for timber and standage and for bogies. All three requirements were contradictory; if they got one they could not get the others. Mr. Edward Dumonlin expressed alarm at the attitude of the L. & N.E.R. The profits of the Railway Company were not immediately derived from Dock and Wharfage dues but from other means which made the railways pay and which had made Hull a very profitable port to them. No trade should be stifled for want of proper accommodation and the L. & N.E.R. must be brought to take that view. A resolution was passed pressing upon the L. & N.E.R. the urgent need of immediately proceeding with negotiations with the Hull Corporation to obtain the use of the Western Reservation for the coming timber import season and make such additions as were necessary.

Shipping Traffic at Hamburg.

Returns for First Quarter show General Advance.

A Report received by the Department of Overseas Trade from His Majesty's Consul-General at Hamburg states there was an increase in the volume of tonnage calling at the port in March as compared with February of approximately 200,000 tons both entered and cleared, the increase in each case being mainly accounted for by the tonnage with cargo.

British shipping in March amounted to 215 vessels (435,400 tons) entered and 217 vessels (429,648 tons) cleared compared with 197 vessels (352,456 tons) entered and 202 vessels (368,568 tons cleared in February).

German tonnage in March amounted to 720,480 tons entered (677,817 tons in February) and 752,288 tons cleared (718,928 tons in February).

The following tables show the tonnage entered and cleared at Hamburg during the month of March and for the first three months of the year compared with previous years:—

COMPARATIVE TABLE.

Year.		With Cargo. Vessels.	With Cargo. Reg. Tons.	In Ballast. Vessels.	In Ballast. Reg. Tons.	Total. Vessels.	Total. Reg. Tons.
			ENTERED.				
1924	...	643	979,677	83	74,208	726	1,053,885
1925	...	1,002	1,349,697	134	97,173	1,136	1,446,870
1926	...	883	1,200,421	147	101,748	1,030	1,302,169
1927	...	1,070	1,458,438	148	95,550	1,218	1,553,988
1928	...	1,271	1,669,394	190	97,976	1,461	1,767,370
			CLEARED.				
1924	...	552	568,457	184	269,504	736	837,961
1925	...	965	971,260	225	350,772	1,190	1,322,032
1926	...	1,038	1,072,019	176	305,219	1,214	1,377,238
1927	...	1,470	1,224,026	237	426,318	1,707	1,650,344
1928	...	1,482	1,344,791	226	475,043	1,708	1,819,834
			ENTERED.				
1924	...	2,057	3,073,031	313	286,649	2,370	3,359,680
1925	...	2,738	3,766,133	494	338,342	3,232	4,104,475
1926	...	2,533	3,460,818	457	346,340	2,990	3,807,158
1927	...	3,049	4,162,815	486	312,488	3,535	4,475,303
1928	...	3,480	4,842,530	488	323,689	3,968	5,166,219
			CLEARED.				
1924	...	1,829	2,204,414	627	936,608	2,456	3,141,022
1925	...	3,096	3,045,645	606	1,018,744	3,702	4,064,389
1926	...	2,950	3,078,832	436	769,237	3,386	3,848,069
1927	...	3,852	3,290,797	585	1,116,691	4,437	4,407,488
1928	...	3,829	3,952,837	614	1,218,293	4,443	5,171,130

Personal enquiries regarding all shipping and transport matters should be made at the City Office of the Department (Shipping and Transport Section), 73, Basinghall Street, London, E.C. 2.

NEW ORLEANS AND JAVA.

Through service between New Orleans and Java Ports at the direct rates applying between New York and Java has been arranged for by the Tampa Inter-Ocean Steamship Company in connection with its American Pioneer Line Services. It is anticipated that this will assure a regular movement of Java exports and imports through the Port. The service will be of great advantage to all shippers and importers of the Mississippi Valley and Middle West States, affording them shorter and prompt movements on regular schedules. Transshipment will be effected at Shanghai by arrangement with the Java-China-Japan Line.

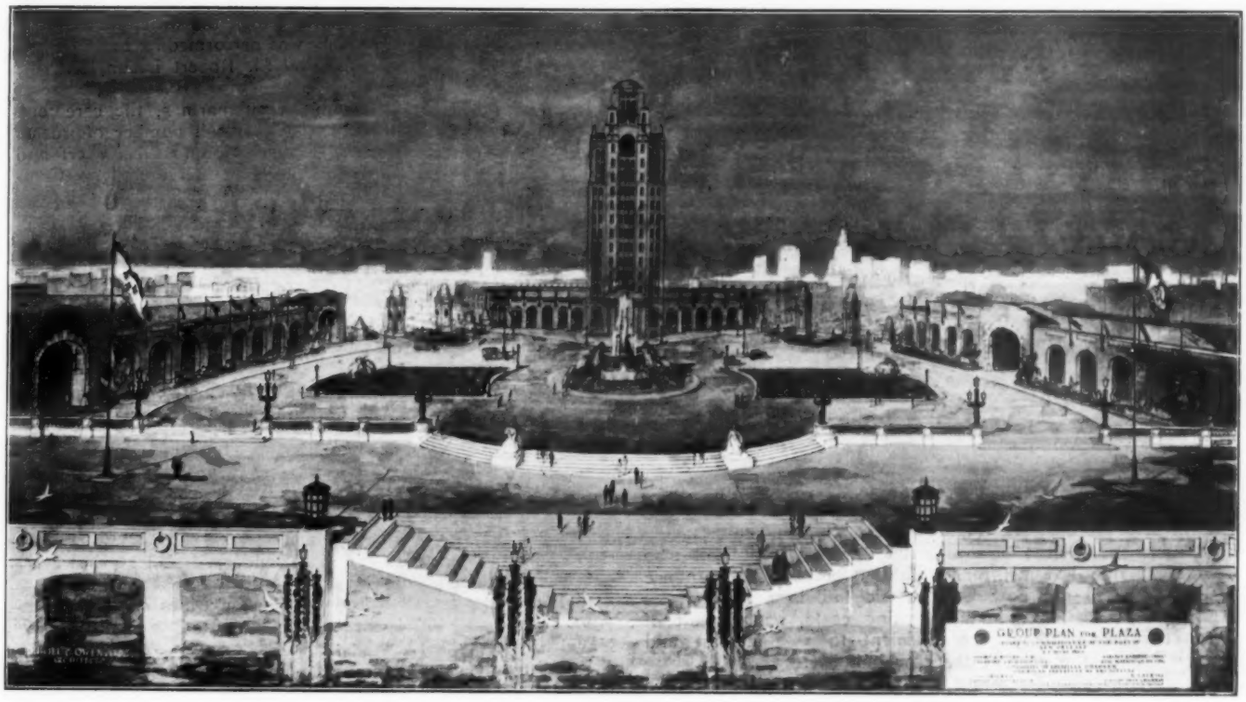
Port Improvements at New Orleans.

New Wharves and Plaza Scheme under Construction.

By SAMUEL YOUNG, Chief Engineer to the Board of Commissioners, Port of New Orleans.

During the past ten years the Port Commission of New Orleans has expended large sums of money in extending and improving port facilities.

Within that period the Inner Harbour Navigation Canal has been constructed at a cost of approximately $20,000,000, and about $12,500,000 more has been expended in the construction of new wharves and other facilities and in the reconditioning of old wharves.



Plaza Improvement along Port of New Orleans Waterfront.

THE GREEN COFFEE TERMINAL.

The programme for further improvements, both authorised and contemplated, is as yet far from completion, and at the present time there are important structures being built.

Notable among these is the new green coffee terminal known as Poydras Street Wharf. This structure will have a frontage of about 1,300 ft. on the Mississippi River, and, of this frontage, 840 ft. will be occupied by a two-storey and the remainder by a one-storey transit warehouse. The entire area under cover, including the second floor, will be approximately 530,000 sq. ft. The front and rear aprons will have an area of about 77,000 sq. ft. The single-storey building will have railroad service both on the river apron and in the rear. The two-storey structure will have tracks in the rear only. Both buildings and all floors will be accessible to motor and horse-drawn vehicles. These structures will be of reinforced concrete and steel throughout, except roofs, which will be built-up composition on T. and G. wooden sheathing.

Foundations are of reinforced concrete on wooden piles, approximately 9,000 piles were driven. Piles for the low level footings are of untreated yellow pine, of lengths 75 to 85 ft. These were cut off at about low water line. Maximum loading was figured at approximately 10 tons per pile. High level foundations have creosoted pine piles (16 pound full cell treatment) in lengths of 60 to 75 ft.

Upon the reinforced concrete footings is being erected a structural steel frame. All columns will be Bethlehem shapes. Bethlehem and Standard I-beams will carry reinforced concrete floor slabs, except that portion of the lower floor which will rest on earth fill on the crown of the levee. Roof trusses will be of the usual type, and channels will be used for purlins. Walls of the transit warehouses will be of galvanised corrugated steel attached to channel longitudinal girts by means of galvanised wire clips. These warehouses will be equipped with rolling doors located in alternate bays—openings will be approximately 20 ft. wide by 12 ft. high. Lighting will be accomplished by means of skylights, and monitor lights for day, and electric lights for night. Light wells through the upper floor slab will permit daylight to reach the lower storey.

Live loads of 350 pounds per sq. ft. have been provided for on all floors.

Importations of green coffee through the Port of New Orleans amount to about 3,000,000 bags (396,000,000 pounds) annually, and this coffee terminal will easily take care of total importations, and will also provide space for other commodities of import.

The estimated total cost of the coffee terminal is approximately $2,000,000.

THE POLAND STREET WHARF.

In addition to the construction of the green coffee terminal, above described, the Port Commission of New Orleans is gradually rebuilding the U.S. Army Supply Base Wharf, which was destroyed by fire in 1922. This wharf was a quay type structure, approximately 2,000 ft. long by 170 ft. wide, and consisted of a creosoted pine pile and timber sub-structure carrying a two-storey structural steel transit warehouse. The loss was complete, except for foundation piles, which were burned to the elevation of low water.

By agreement with the Federal Government the Port Commission is rebuilding this wharf, which is called Poland Street Wharf, at the rate of approximately 400 linear ft. annually, provided the stage of the river is such as to permit the construction of foundations at extreme low water.

The general design of Poland Street Wharf is quite similar to that of Poydras Street Wharf. However, Poland Street Wharf is a single-storey structure, and, of course, concrete footings had to be designed to fit existing piles, except on the river edge, where new piles must be driven. It is estimated that, when completed, this wharf will have cost approximately $1,750,000, exclusive of existing piling.

ST. ANDREW STREET WHARF.

St. Andrew Street Wharf, which consists of creosoted pine pile and timber sub-structure, carrying structural steel transit warehouse, is now twenty-one years old, and is more or less obsolete. This wharf has a river frontage of 1,609 ft. It is now in process of reconstruction. The floor level will be raised and the wharf will be widened and a reinforced concrete floor slab will be substituted for existing wooden floor. The total

View of Poydras Street Wharf Construction, November, 1927.

Girder Work at Poydras Street Wharf in course of erection.

cost of reconditioning St. Andrew Street Wharf will be approximately $525,000.

Another section of wharves, which are obsolete and which are on the programme for reconstruction within the next three or four years, is the section between Canal Street and Esplanade Avenue. The total frontage is about 4,470 ft., and the total estimated cost is approximately $2,500,000, exclusive of real estate that may have to be acquired.

EMBELLISHMENTS AT THE FOOT OF CANAL STREET.

The Board of Commissioners of the Port of New Orleans has, during the past five or six years, expended a considerable sum of money on aesthetic features, particularly at the foot of Canal Street. A plaza is being erected, with suitable entrances from the river and from commercial centres of the city, through Canal and Poydras Streets. On the upper side of this plaza will be the new green coffee terminal, and the Canal Street ferry terminal forms the lower or down-stream side of the quadrangle. Towards the city, and lying between Canal and Poydras Streets, will be a stores-shops-and-office building, which will be erected by the Board. Engineering, dock, purchasing and storekeeping departments of the Board will have offices in this building. It will permit of the consolidation of machine shops and a garage, which now occupy two buildings situated several miles apart, and it will also provide suitable housing for valuable stores of maintenance materials, which are now kept in old buildings at different locations. Saving in annual operating costs, as a result of these consolidations, will be sufficient to pay interest and depreciation on the cost of the new building.

The general plan for these embellishments contemplates a monumental fountain in the centre of the plaza, and ornamental pylons at the Canal and the Poydras entrances. Of course, the plaza is to be paved. The plan also contemplates that, at some time in the future, the city side of the plaza will be occupied by a monumental administration building, which will provide offices for all departments of the Board, except, perhaps, the personnel of the Public Grain Elevator and the Public Cotton Warehouse. The stores-shops-and-office building referred to in the paragraph above has been designed to fit in with the proposed Administration Building, and foundations which will be common to the two buildings have been designed accordingly.

This group of buildings about the plaza will be of dignified design and construction, being of concrete, steel and stone, and will be in keeping with the importance of New Orleans as a port. The total cost of these buildings about the plaza, including fountain, paving and ornamental lighting, is estimated at approximately $1,400,000. When the coffee terminal is finished, three sides of the plaza will have been completed. Bids are now being invited for a two-storey building on the city side. The monumental administration building, which will harmonise with the two-storey structure, the fountain and the pylons, are yet in the future, and will be erected as funds are available.

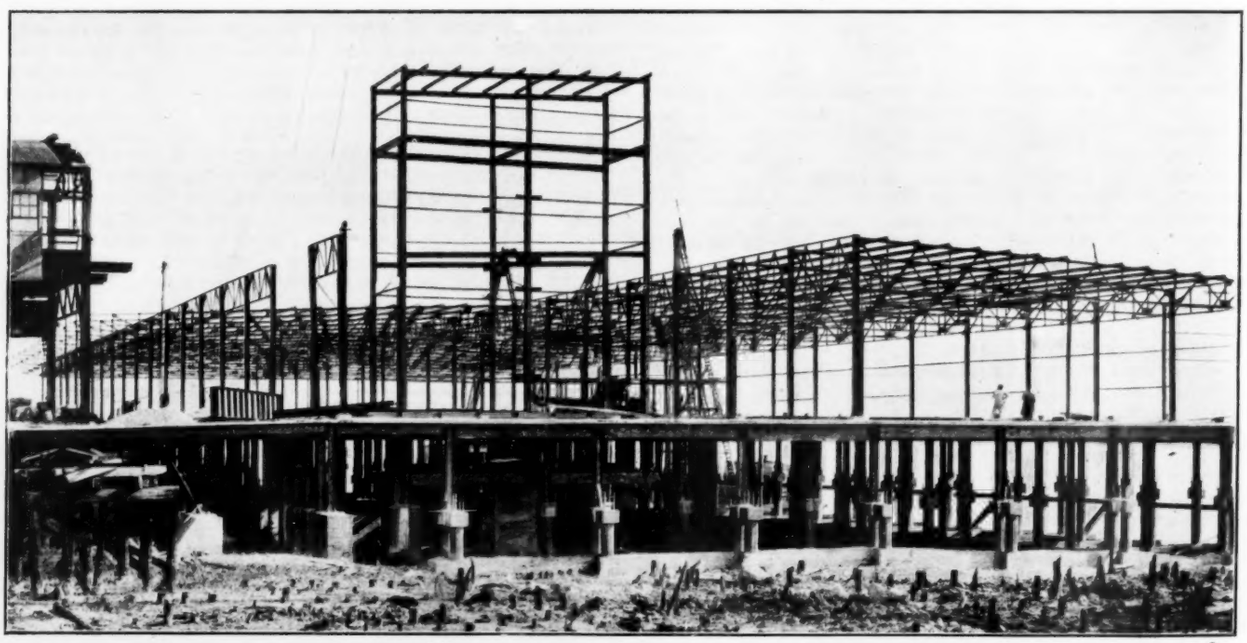
Launch of Submarine.

The first of the five submarines being built by private contractors under the 1926 Naval Programme was launched at the Naval Construction Works at Barrow-in-Furness on Saturday, May 19th, when H.M.S. " Osiris " took the water for the first time. The christening ceremony was performed by Lady Dixon, the wife of Engineer Vice-Admiral Sir Robert Dixon, K.C.B., the Engineer-in-Chief of the Fleet.

As is usual in the launching of submarines, the ceremony was of a very private nature, only a small number of guests being invited. These included, in addition to Sir Robert and Lady Dixon, Mr. and Mrs. Graesser, of Llangollen; Commander C. W. Craven (managing director of the Naval Construction Works) and Mrs. Craven; Mr. G. W. Barr (special director) and Mrs. Barr; Mr. J. Callander (special director) and Mrs. Callander; Mr. W. E. Prichard (special director); Engineer-Captain and Mrs. A. E. Lester; Engineer-Commander L. Turner; Mr. A. Nicholls; Mr. and Mrs. E. G. Kennett; Mr. and Mrs. A. Chantler; Engineer-Commander and Mrs. L. Thackara; Engineer-Commander and Mrs. D. P. Rowland; Mr. J. Peacock; Mr. A. and Miss Vickers; Mr. and Mrs. W. F. Rabbidge; Lieut.-Commander and Mrs. A. E. Cumming; Mr. W. Johnson; Mr. and Mrs. D. McLachlan.

In addition to the " Osiris," Messrs. Vickers, Limited, are constructing two further " O " Class submarines under the same programme, viz., the " Oswald " and " Otus," which will be launched in June and August respectively. They are also building four " P " Class submarines for the British Navy under the 1927 programme, which will be named " Perseus," " Poseidon," " Proteus " and " Pandora." These, however, will not be launched until next year.

Including the two " Nordenfelt " submarines constructed in 1886-7, the " Osiris " is the 147th submarine launched from the Naval Construction Works, which proves beyond doubt the claim of Vickers, Limited (now Vickers-Armstrongs, Limited) to be the foremost builders of submarines in the world. Their predecessors, the Naval Construction and Armaments Company, were the pioneers of submarine construction in this country, and the first submarines of fourteen different classes have been delivered from the works. Until a year or so before the war they were the only private firm constructing submarines in the British Isles. During the war they delivered a total of 53 submarines to the British Admiralty, which is a larger number than the combined output of all other private builders. Since the end of the war only twelve submarines have been ordered from private contractors by the British Admiralty (two for the Australian Government), and it is significant that out of this total Vickers, Limited, have received orders for nine.



Poland Street Landing, New Orleans, looking downstream, during building, December, 1923.

The Harbour Plan of Chicago.

Development of Group of South Michigan Harbours part of Scheme advocated by Independent Committee on Chicago Harbour and Port Survey.

INTRODUCTION.

ON December 3rd, 1924, the Council of the City of Chicago created a Port Commission in response to a suggestion from the War Department that a thorough study of all problems affecting the interests of the Port of Chicago was advisable. In order to determine the probable expense of an investigation this Commission had a short preliminary report made by Major-General W. M. Black, late Chief of Engineers, of the United States Army. Based on his report a budget was prepared covering the work to be done, showing a requirement of about $50,000 to complete the survey in the year 1926. This amount, however, could not be spared for this purpose from City funds.

Wishing to continue its contribution to the general improvement of the City of Chicago, in a manner similar to and commensurate with its former work and realising the importance of the problem and that it is one which could best be solved by an impartial group of citizens, the Commercial Club of Chicago expressed its willingness to raise the necessary funds and conduct this study if invited to do so by the City. The invitation to make this investigation was extended by the City Council to the Commercial Club in a letter from Hon. William E. Dever, Mayor, to Mr. Rufus C. Dawes, president, Commercial club of Chicago, arising out of a City Council resolution on January 6th, 1926, authorising the Mayor to appoint a committee consisting of the Commissioner of Public Works, Corporation Counsel, Chairman of the Committee on Harbours, Wharves and Bridges, Chairman of the Committee on Finance, Chairman of the Committee on Railway Terminals and Chairman of the Committee on Local Industries, Streets and Alleys, of the City Council, to co-operate with the commercial organisation in the study of the terminal needs of the Port of the City of Chicago.

The Mayor added that the present financial condition of the City rendered it difficult, if not quite impossible, for the City to undertake the work immediately, and expressed appreciation of the value of the opportunity offered by this co-operation and of the substantial service to the City.

The resolution adopted by the City Council, January 6th, 1926, and submitted with Mayor Dever's letter, stated that there existed an emergent need of a thorough and careful study of the Port of Chicago and its terminal needs, and that the Port Commission, created by ordinance passed December 3rd, 1924, had found that the principal condition of the City did not warrant the addition of the necessary amount to the appropriation for 1926.

The Commercial Club of Chicago, through its Executive Committee, expressed its willingness to raise the necessary funds to conduct this study and make such recommendations as are proven wise and necessary by this study, to the City Council of the City of Chicago.

The City Council therefore resolved that the Commercial Club of Chicago be invited to proceed with this work and to present to them such recommendations shown by study to be urgently needed and a plan for the future development.

It was further resolved that in order to secure co-operation in the Port of the City with the Commercial Club, the Mayor appoint a committee consisting of the Commissioner of Public Works, the Corporation Counsel, the Chairman of the Committee on Harbours, Wharves and Bridges, Chairman of the Committee on Finance, Chairman of the Committee on Railway Terminals, and Chairman of the Comittee of Local Industries, Streets and Alleys to act as a means for such co-operation.

A fund of approximately $50,000 was subscribed by members of the Commercial Club for this purpose. The work was started July 1st, 1926, and has been carried to completion under the direction of the Committee on Chicago Harbour and Port Survey by a staff comprising Major Angus W. Putnam, formerly O.S. District Engineer in Chicago, in charge; V. K. Hendricks, former Assistant Chief Engineer, St. Louis and San Francisco, R.R., railroad engineer; E. J. Kozlik, Engineer of Design; Oscar Romel, Statistician and Economist, and Alice M. Doyle, secretary.

CONCLUSION AND RECOMMENDATIONS.

PORT FACILITIES.

The fundamental purpose of a port is to facilitate the transference of passengers and cargo between land carriers and water carriers. In accomplishing this purpose it is therefore desirable to bring the land and water highways to a common point of convergence, for much lost time and additional expense are involved if it is necessary to employ intermediate transfer agencies.

Service of the least flexible class of carrier generally governs in the location and general layout of a terminal. In a port, ships are by far the largest carriers and the most difficult to accommodate, hence the desirability of selecting locations which are easily reached from the open lake, and of insuring that every effort is made to expedite the turn-around of ships. This can be done by making each of the several harbour developments complete in all aspects so that a ship may obtain full service in one place, and, if possible, at one berthing. This involves, principally, the provision of adequate rail, street, and barge waterway connections at each harbour site.

The execution of a comprehensive port development is a comparatively simple matter where there is little or no occupation by the various activities which are requisite to modern civic life, but it is rarely the case, given such freedom in matters of location and design, that there is need for port development of any magnitude, for one of the important fundamental factors upon which the supremacy of a port depends is missing; namely, a large tributary commerce.

While this general theory is usually applied to a large hinterland, it is equally true with regard to a smaller region such as the Chicago Metropolitan District. The localities in greatest need of port facilities are usually those where congestion is the most severe, and while it is entirely possible to plan and build port developments in isolated locations they would in all probability lie idle for many years to come unless they fulfilled some special mission other than the general service of the entire region.

This situation at Chicago has led to difficulties in the past, for the attempt to maintain a major port development in the heart of the city has caused continual conflict between opposing streams of traffic, i.e., between the water traffic on the Chicago River and the land traffic on the bridges over the river. The condition has been all the more serious because there were few interests in common between the land and the water traffic, and the toleration which generally creates a measure of relief where there are common interests has been entirely lacking in this case.

Needless to say, the same situation is likely to obtain in the future wherever an inland port development is made in the Chicago region. Land traffic is going to continue to increase, and locations which now appear to involve little conflict between land and water traffic cannot be relied upon to enjoy the same degree of accessibility a generation hence.

A study of the trend of maritime affairs in the Chicago region indicates a general upward movement in the receipt and shipment of raw materials, food supplies, and manufactured goods by water. There is no reason to believe that this trend will slacken. An investigation of the probable effect of the completion of the Illinois Waterway and of the St. Lawrence Waterway indicates that there will be a substantial increase in the use of water transportation in the Chicago region. Port facilities, therefore, should be located and planned in such a way as to provide for indefinite expansion.

Considering the foregoing facts and reasoning it is concluded that all future major port developments for the service of ships should be located on the lake front, for only by so doing will it be possible to avoid the difficulties of the past and fulfil the requirements of the future. This principle applies to all classes of harbours for ships, i.e., commercial, industrial, and bulk interchange harbours.

With regard to commercial harbours for the general service of the Chicago region, the necessity of selecting locations where it is reasonably practicable to bring land and water highways to a common point, and the desirability of handling the greatest amount of local traffic with a minimum haul, narrows the choice to a very few sites. These are:—

At the mouth of the Chicago River;
On the lake front between 16th Street and 41st Street;
Near the old entrance to Wolf Lake, immediately southeast of the Illinois—Indiana interstate boundary.

A careful survey of the possibilities of each location develops that no one can be made to fulfil all requisites at reasonable expense. However, a solution combining a moderate addition to the facilities at the mouth of the Chicago River with provision for an extensive ultimate development on the lake front a mile north of the old entrance to Wolf Lake effects a compromise which seems to offer the greatest advantages and least disadvantages.

For industrial and bulk interchange harbour facilities for ships it appears that both the Calumet River and the Indiana Harbour Canal still have capacity in the way of industrial sites and unoccupied water front for some years to come. It develops,

however, that questions of land traffic and channel capacity affect the problem of future use of these two harbours in such a way as to make it unwise to consider them as potential industrial and bulk interchange harbours indefinitely. Like the general commercial harbour, the ultimate development of industrial and bulk interchange harbours for the service of ships must be on the lake front, at a location where all lines of communication may converge, and where there is room for indefinite expansion.

The completion of the Illinois Waterway within the next five years will result in a demand for terminal facilities for the service of barges.

As in the case with ships these facilities will be in two categories, i.e., commercial, and industrial and bulk interchange.

For efficient use by local interests the commercial barge terminal must be as near the heart of the metropolitan district as the various factors influencing location will permit. Questions of bridge interference, railroad service, capacity of site, and access to ship harbours, all have their effect on the selection of the most desirable location and arrangement, however.

The Chicago River and the Calumet River have considerable capacity for industrial and bulk interchange traffic in barges, though, as in the case with ships, the channel dimensions fix the upper limits of capacity, rather than length of water front or area of industrial sites. Consequently, recourse must be had eventually to new locations where this factor may be overcome.

All locations accessible to and used by ships should also be reached by barges in order that the general requirement be fulfilled that ship harbour facilities be common meeting points of all lines of communication. River barges are of a type of construction that does not permit them to navigate the open lake, hence protected passages close to shore or interior routes will be required.

COMMERCIAL HARBOUR FACILITIES—SHIPS.

(1) Lake passenger and package freight vessels, and, ultimately, such ocean liners as may utilise the proposed St. Lawrence Waterway, will be served at the mouth of the Chicago River at the Municipal Pier and at an additional pier to be constructed parallel with, and about 1,800 ft. south of the Municipal Pier; railroad connections with the Illinois Central R. R. and the Chicago and North-Western R. R.; tunnel connection with the Chicago Tunnel Company; and street access from both sides of the river.

(2) Ships carrying general cargo that ultimately may not find accommodation near the mouth of the Chicago River will be served at an interstate harbour on the lake front south of Calumet Park; rail connections to the Elgin, Joliet and Eastern R. R., the Indiana Harbour Belt R. R.; the Belt R. R. of Chicago, and others; street connections to Indianapolis Boulevard via 102nd, 100th, 99th and 98th Streets.

INDUSTRIAL AND BULK INTERCHANGE FACILITIES—SHIPS.

(1) Locations on the Calumet River and the Indiana Harbour Canal should be utilized as long as channel capacity will permit.

(2) Ultimately additional traffic of this character will be accommodated at a harbour development on the lake front opposite the old entrance to Wolf Lake. There rail connections will be available, by means of a harbour railroad system, to the Elgin, Joliet and Eastern R. R., the Indiana Harbour Belt R.R., the Belt R.R. of Chicago, and others.

COMMERCIAL HARBOUR FACILITIES—BARGES.

(1) Barges to and from points on the Lakes-to-the-Gulf Waterway and connecting channels and carrying general package freight will be accommmodated at a commercial terminal on the Chicago Drainage Canal near Crawford Avenue; rail connection via the Belt R. R. of Chicago, the Illinois Northern R. R., and others to and from local industries and points to the north and east; waterway connection to the ships' harbour at the mouth of the Chicago River, also to the interstate harbour near Wolf Lake via the Calumet-Sag Canal, the Little Calumet River, and the Calumet River.

(2) When traffic in the Calumet River is large enough to justify the expense a commercial barge terminal will be provided in Lake Calumet.

(3) If and when rail-barge interchange traffic in package freight to and from points to the north and east is of sufficient volume an interchange terminal will be provided in Lake Joliet, a few miles below Joliet on the improved Des Plaines River. There connection may be made with the Elgin, Joliet and Eastern R.R., and through it, with all railroads entering Chicago.

INDUSTRIAL AND BULK INTERCHANGE FACILITIES—BARGES.

(1) Industries now located on the Calumet and Chicago Rivers will utilize barge transportation to a certain extent. Those on the Indiana Harbour Canal will be given the same opportunity by the widening, deepening and straightening of the Grand Calumet River.

(2) New industries desiring barge harbour facilities will be accommmodated at sites to be provided in Lake Calumet, where rail connection will be provided to the Belt Railroad of Chicago, the Indiana Harbour Belt Railroad, and others.

(3) As the barge movement between the Main Drainage Canal and the Calumet District increases the Calumet-Sag Canal will be widened.

(4) When rail-barge interchange traffic in bulk freight to and from points to the north and east is of sufficient volume an interchange terminal will be provided in Lake Joliet as in the case with package freight.

MISCELLANEOUS.

No recommendations are made herein for private projects or for those which are largely of local significance. The harbours at Racine, Kenosha, Waukegan, Buffington, Gary, and Michigan City are in this class. The solution of problems involving water traffic at these locations is more properly a function of those directly interested; their affairs enter into the general situation only insofar as they are able to handle a portion of the general flow of traffic. In this respect these local situations have been considered, but a more detailed investigation would be an intrusion into local affairs.

IMMEDIATE STEPS.

It is recommended that early action be taken with reference to all of the improvements proposed at the mouth of the Chicago River with the exception of the construction of the additional pier, as there is now a need for adequate rail service, and furthermore, with the addition of the facilities suggested ships would be attracted away from river terminals and thus a certain amount of interference with land traffic would be eliminated.

It is recommended that steps be taken at once to acquire property, rights of way, and privileges essential to the construction of the commercial barge terminal on the Chicago Drainage Canal and to the industrial harbour in Lake Calumet, and that construction of the first unit at each location be undertaken in time for completion by the opening of the Illinois Waterway.

Recommendation is also made that the improvement of the Grand Calumet River between its confluence with the Little Calumet and its junction with the Indiana Harbour Canal be undertaken as soon as practicable; also that an agreement be reached with all authorities interested to the effect that all new bridges over the Main Drainage Canal, the Calumet-Sag Canal, the Little Calumet River between Blue Island and Lake Calumet, and the section of the Grand Calumet River to be improved, have a vertical clearance of at least 21 feet.

And it is finally recommended that the shore lands essential to the development of the interstate harbour on the lake front, and the easements and essential rights of way, be acquired at an early date.

FIXED BRIDGES.

One of the controlling factors in the initiation of this investigation of port requirements for Chicago has been the desire of the city to take appropriate measures looking to the ultimate permanent closing of movable bridges over the Chicago River. The direct cost to the city for building, maintaining and operating movable instead of fixed bridges has been estimated to amount to $900,000 annually; future direct annual costs may be as great as $2,000,000. Indirect annual costs such as delays to land traffic have been estimated as amounting to $200,000; future costs of this character might exceed $800,000 annually.

It is probable that the city is justified in expending a considerable sum in overcoming these losses provided, in so doing, the actual damage occcasioned riparian owners and navigation interests is not incommensurate with the benefits to be expected.

In a report made by the War Department to the Congress of the United States dated March 1, 1927, there were enumerated the various effects, beneficial and otherwise, of the closing of the bridges over the Chicago River. The following quotations are of particular interest here:

"Closing the bridges having ample clearance for barges, lighters, tugs, and car floats would have no adverse effect on the grain trade, all of which could be handled to better advantage on the Calumet River.

"The local traffic in lake-borne anthracite coal, averaging over 300,000 tons annually, would cease with the closing of the bridges. The margin over all-rail shipments is slight, however; too small to have any effect on the price to the consumer. The loss of this traffic is not considered serious.

"Interchange traffic in anthracite coal can be handled to better advantage on the Calumet River than on the Chicago River. No loss is expected to result to this business if the Chicago River Bridges are closed.

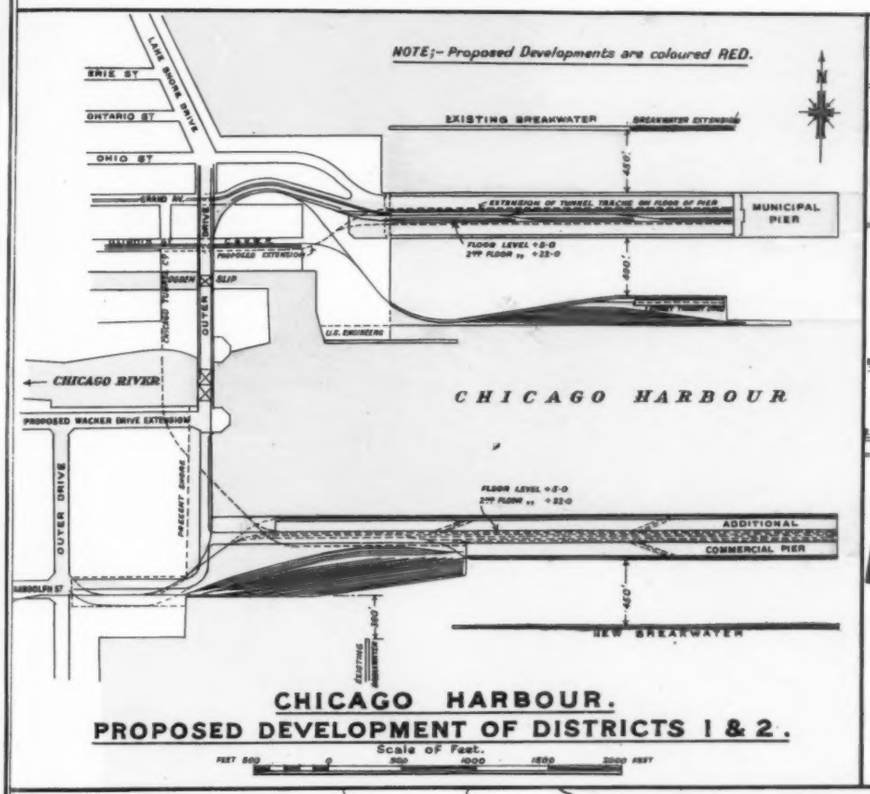
"Lumber and binder twine will have to be transferred at a lake-front terminal and carried to or from existing terminals or points of receipt or shipment by truck or lighter. Over-all costs of shipment will be increased, with possibly adverse results to the traffic.

"Interchange package freight can be handled to better advantage on the lake front, provided suitable rail connections to terminals are available. Local package freight is now largely handled at lake front terminals, so that no material damage will result to it if the river is closed.

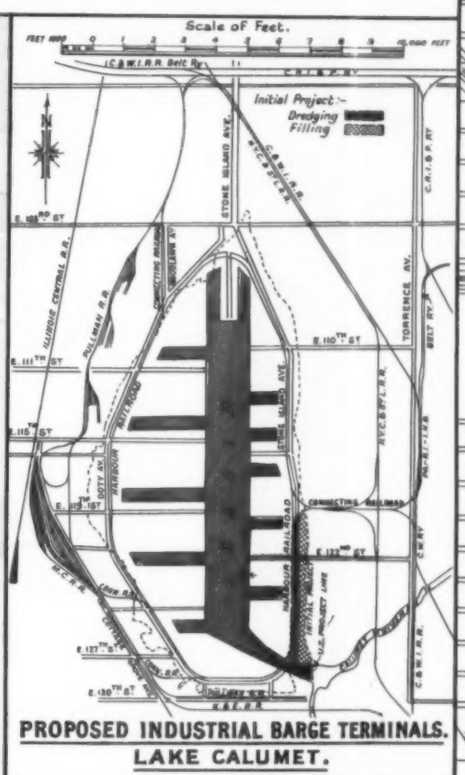
CHICAGO & CALUMET HARBOURS.

PROPOSED DEVELOPMENT SCHEME.

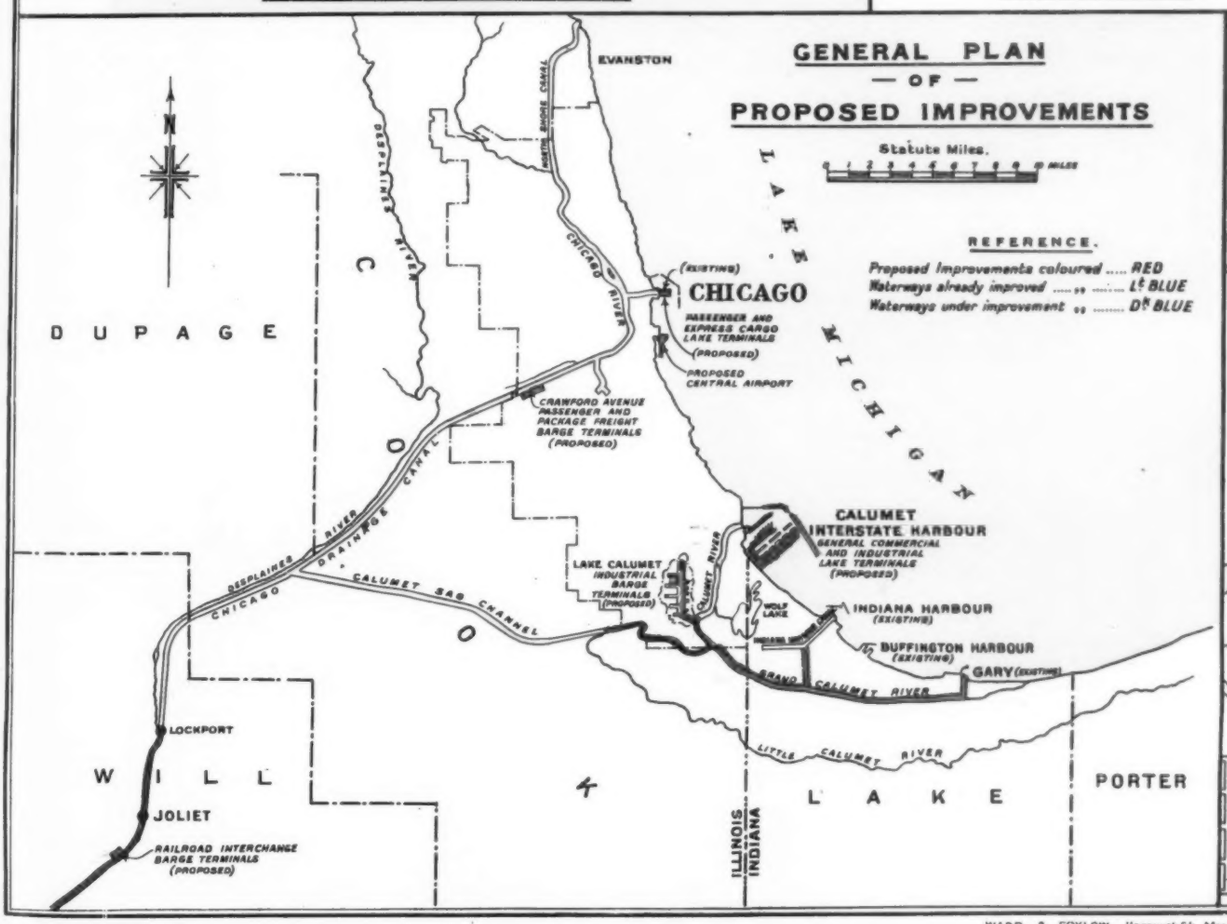
LINES OF EXPANSION ADVOCATED BY INDEPENDENT COMMITTEE ON CHICAGO HARBOUR & PORT SURVEY.



CHICAGO HARBOUR.
PROPOSED DEVELOPMENT OF DISTRICTS 1 & 2.
Scale of Feet.



PROPOSED INDUSTRIAL BARGE TERMINALS.
LAKE CALUMET.



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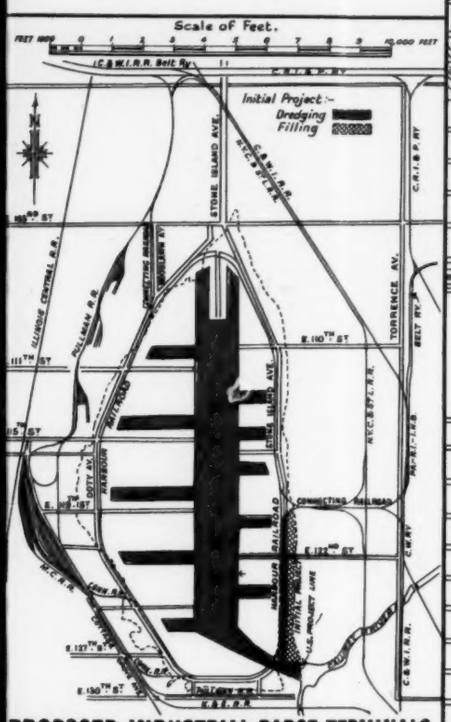
TO THE DOCK AND HARBOUR AUTHORI

HARBOURS.

SCHEME.

GO HARBOUR & PORT SURVEY.



PROPOSED INDUSTRIAL BARGE TERMINALS.
LAKE CALUMET.

RAL PLAN
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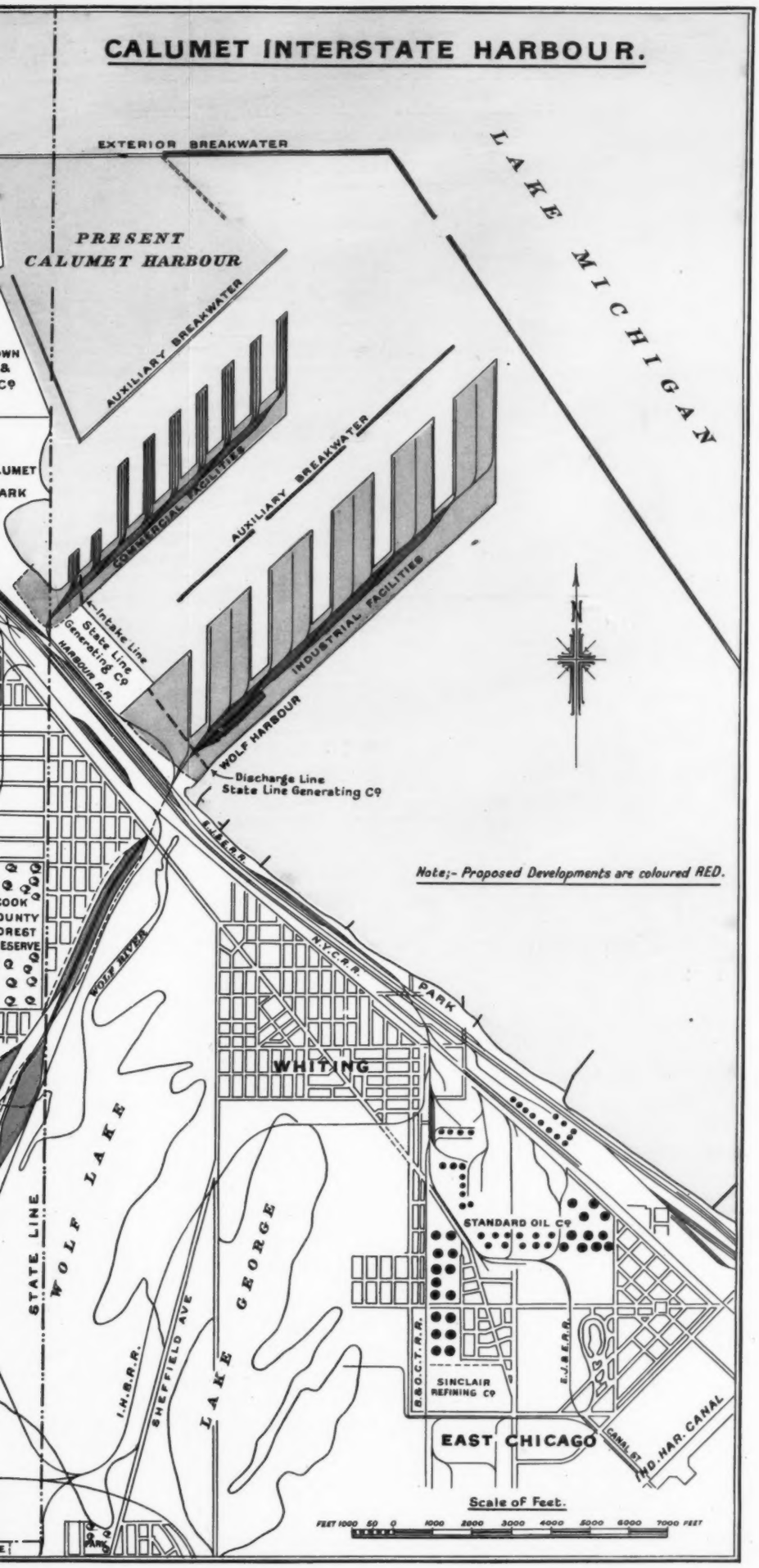
WARD & FOXLOW Harcourt St. Marylebone. W.1. 5140.

HORITY – JUNE, 1928.



"The lake traffic in sand and gravel will be kept out of the river, if the vessels now in use are to be retained in service, unless lightering or trucking from the lake front is resorted to. It is possible that carriers may be designed and put into service which may operate economically with limited headroom. In any event, the effect would be to increase the cost of these materials to the consumer.

"The lake passenger traffic will have to be handled from a lake-front terminal, but there is no reason to believe it can not be taken care of as efficiently there as at river terminals.

"Closing the river to masted vessels will have little or no effect on potential lake or ocean traffic, provided the few remaining harbour sites on the lake front are conserved for harbour purposes and developed as required.

"The provision of adequate lake-front terminals will be of material benefit to potential lake and ocean commerce. The combined effect of closing the river to masted vessels and providing modern lake-front terminals should be beneficial to the interests of navigation as a whole."

The Harbour Plan recommended herein should have the result, as its provisions are put into effect, of reducing to a minimum the disadvantages of closing the river to masted vessels. With the main barge terminal located in the extreme western portion of the city there will be little occasion for the large package freight barges, which require 21 feet of headroom, to navigate the congested portions of the Chicago River. Unquestionably it will be much cheaper to lighter the small amount of package freight between points east of Crawford Avenue and the barge terminal than for the large barges to engage in retail collection and delivery.

Provision will be made for the handling of all lake package freight at lake front terminals, also for the delivery of partial cargoes of grain at the lake front terminals. Substitute elevator service for that now remaining on the Chicago River will be made available at the Interstate Harbour in the course of time. The necessity for package freighters and grain vessels on the Chicago River will therefore disappear.

It is therefore proper to state that the Chicago River will cease to be a factor as a location for water terminals for masted vessels as the measures herein recommended become accomplishments. Fixed bridges, while not a part of the Harbour Plan, are one of its objectives, and the means suggested for making them possible are therefore all the more strongly urged.

AIRPORTS.

The solution of a comprehensive program of airport development for the Chicago Region involves the construction of a central landing field, which, on account of the prohibitive costs attending its construction in partially built-up sections of the city, will have to be provided at some location on the lake front that does not interfere with superior uses of the limited areas available.

The harbour plan proposed herein does not comtemplate the use of the submerged lands in Harbour District No. 3 between 16th and 31st Street; nor do plans for the development of the South Park system involve this area. Accordingly it is recommended that a central airport be built lakeward of the park system and immediately south of 16th Street extended, with the reservation, however, that there be no hangars and shops at this location, only minor facilities for the accommodation of passengers and planes and for the temporary shelter of cargo.

PORT ADMINISTRATION.

In view of the many local governing bodies having certain jurisdiction over public waters, with grants of power direct from the legislature of the State of Illinois, it appears desirable that the paramount local power over the use of public waters which, now or in the future, are likely to be of value for the purposes of navigation, should be lodged in one central authority.

It seems to be the policy of the Federal Government to confine its activities to providing main channels and major works of harbour protection and to protecting public waters from encroachments which would interfere with the full use of such works of improvement.

In a few instances state governments have discharged the functions of local port authorities, either through one of the regular state departmental agencies or by means of special commmissions, but this means of conducting the local affairs of a port seems to have been applied either where the locality was largely unable to finance the undertakings involved, or the interests of the State in public waters not being fully conserved. In Illinois the State's interests are well safeguarded through its agency, the Division of Waterways, Department of Purchases and Construction. With authority to finance, a local body should experience no difficulty in raising funds.

It therefore appears desirable that the port authority to be created be a local governing body with limited jurisdiction over the region commonly referred to as the Chicago Metropolitan District. The object of a port authority is the promotion of the maritime and commercial interests of the region over which it has jurisdiction. A broad conception of this object includes governmental and commercial activities of many kinds, representing a community of interest among political, business, industrial and port enterprises. The port authority should be so constituted as to reflect this community of interest, and partisan politics should play no part in its appointment.

The port adminstration should be authorized to finance its operations in such a way as to make it self-supporting. Bonding power will be necessary; possibly, also, taxing power, but the latter should be avoided if practicable.

The general powers to be conferred by the state upon the port authority should be broad enough for it to function in its allotted field without too many restrictions to hamper the efficient conduct of business, yet in sufficient detail to insure a clear understanding of the limitations. For Chicago the purpose of powers to be granted seems to be the creation of an agency that can plan and execute projects involving all phases of the development and operation of ports and port facilities. This agency should be able to protect these projects from interference by the operations of others and it should be in a position to operate any or all of the elements that go to make a well equipped port.

The situation at Chicago is different from that of most ports in that the economic region of which the city is the focus includes parts of other states. Increased demand for port facilities will require the development of a harbour in Indiana. Statutory authority for the port administration to operate in another state therefore seems requisite.

HISTORICAL.

In the early days in the history of Chicago the waterways were used in their natural state, little or no attempt being made to improve them. The first real step in the direction of improved facilities was the Act of Congress of March 2, 1827, granting to the State of Illinois certain public lands of the United States for the purpose of enabling the State authorities to finance and undertake the construction of the Illinois and Michigan Canal which was proposed to connect the Chicago River with the navigable portion of the Illinois River. The first contracts for the construction of this canal were June 6, 1836. Due to lack of funds construction was delayed from time to time so that it was not until the year 1848 that it was completed.

In later years four docks and dams on the Illinois River were completed, two by the State of Illinois and two by the Federal Government, so that a channel at least six feet deep was available between Chicago and St. Louis.

CHICAGO RIVER AND HARBOUR.

The Chicago River, instead of heading straight out into the lake as it does now, originally turned south about where Rush Street is now located and ran parallel to the lake shore before entering near what would now be Monroe Street extended. The first work of improvement was cutting through the bar, thus providing a straight outlet, and constructing a pier on the north bank. There is no date of record of the beginning of any of this work. The United States Government extended the piers in 1836 or 1837 and at some later date the City of Chicago made an extension. Additions were made later on by the United States Government and the City to both piers until now they terminate some six to seven thousand feet from the mouth of the river as it existed in the thirties. In 1867, Mr. W. B. Ogden, president of the Chicago Canal and Dock Company, was authorized by the Secretary of War to construct a slip in connection with the proposed extension of the North Pier. This slip, known as the Ogden Slip, is in use to this day.

By 1870 the commerce of the Port of Chicago had grown to such an extent that the river was totally inadequate as a harbour. On the 5th of June, 1869, 212 vessels reported at the port, while during the three summer months of that year the arrivals and departures totalled over 12,000. An anchorage basin on the lake front was necessary to accommodate vessels waiting to get to their docks on the river, and additional docks and slips on the lake front were urged. Congressional appropriations were finally obtained so that by 1880 the anchorage basin off the present location of Grant Park was dredged and enclosed by a breakwater.

In 1889 the exterior detached breakwater was built by the United States authorities to serve as a protection from storms from the north to vessels entering the harbour. With the completion of this breakwater Chicago's lake commerce began to assume large proportions and in the early nineties the number of arrivals and clearances at the Port of Chicago were not exceeded by any other port in the United States. At that time the total receipts and shipments averaged 10,000,000 tons per year.

Up to the early nineties, the improvement of the Chicago River was undertaken by the City of Chicago and riparian owners. The Federal Government had restricted its work to providing a safe and free entrance to the Chicago River. The river had been improved by dredging and by the construction of bulkheads and docks so as to provide a channel with a least depth of 15 feet and of varying width. As this depth did not compare favourably with that available in other lake harbours Congress was prevailed upon to provide funds for the improvement of the river by Federal agencies. A 16 foot project was entered into by the War Department in 1896 and

completed in 1899, the depth at that time being limited by the height of the crowns of the tunnels under the river.

Subsequently the tunnels were lowered, and to meet the demands of vessels of the larger type a 21 foot project was adopted by the Federal Government in 1907 and completed in 1914. Simultaneously, the Sanitar District of Chicago, in providing a channel of adequate dimensions to permit the withdrawal of a large quantity of water from Lake Michigan to dilute the sewage of Chicago and divert it from the lake, widended, deepened and straightened the river from the Forks at Lake Street to the entrance to the Drainage Canal at Robey Street.

While all these improvements to the Chicago River were being made to make the stream a suitable harbour for vessels of the larger type, commerce steadily declined. From a maximum of eleven million tons in 1889 it had fallen to five million tons in 1907.

Local as well as Federal authorities viewed this diminishing commerce with concern and vigorous steps were taken to stem it. This decline coupled with the plans for park development along the lake front which threatened to prevent its use for harbour purposes led Mayor Busse, in a message to the Chicago Council on January 6, 1908, to demand that steps be taken to revive the declining commerce and to reach some conclusions as to how far park development should be allowed to interfere with harbour facilities.

The City Council promptly complied with the suggestions of Mayor Busse and directed the appointment of a Harbour Commission to investigate and report upon those matters. The Commission was duly appointed and in an able report published in 1909 recommended the development of an outer harbour immediately north of the entrance to the Chicago River. The harbour was to be so designed as to provide facilities for handling freight and passengers, replacing those on the river which were falling into disuse.

No immmediate action was taken on the report of the Chicago Harbour Commission, but in 1911 a sub-committee of the Committee on Harbours, Wharves and Bridges of the City Council concurred in the recommendations of the Harbour Committee and in addition urged the establishment of Harbour Districts by the City of Chicago under authority contained in section 1 of the Act of the General Assembly of Illinois, approved June 10, 1911, referred to as the Cities and Villages Act.

Simultaneously a detailed investigation of harbour facilities was made by the United States Engineer stationed at Chicago. The result of all these studies and reports was the construction of the Municipal Pier by the City of Chicago at a cost of approximately $4,000,000, completed in 1916, and the extension to the exterior breakwater by the Federal Government at a cost of $3,500,000 completed in the spring of 1923.

CALUMET RIVER AND HARBOUR.

As was the case with the Chicago River, the Calumet in its early state turned southward before entering the lake, having its outlet about 3200 feet south of the present location. The first work of improvement was executed by the Federal Government in 1870, the project being to cut through the intervening bar. This new outlet was protected by parallel piers extending out into the lake. By 1882 a safe entrance to the river was provided for vessels drawing 16 feet of water, and 4850 feet of pier had been constructed.

By an Act of Congress of August 2, 1882, the Federal Government assumed jurisdiction over the Calumet River. Congress subsequently appropriated funds and a 16 foot channel 200 feet in width as far south as Lake Calumet was completed. Some improvement work was done on the stretch between Lake Calumet and Hammond, but later this was abandoned. In 1896 work was begun on deepening the river to 21 feet for the accommodation of the larger vessels. The first two miles of the deeper channel were completed by 1898; this depth was extended to 122nd Street by 1908 and as far as Lake Calumet by 1912.

While those river improvements were in progress a safe entrance to the harbour and an anchorage basin were being provided by the construction of an outer breakwater, completed in 1904.

OTHER HARBOUR IMPROVEMENTS.

The improvement of harbour facilities in what is generally referred to as the Chicago Region has not been confined within the limits of the City of Chicago. Local harbours have been constructed at Racine and Kenosha, Wisconsin, Waukegan, Illinois and Michigan City, Indiana, each serving the territory adjacent to the terminals. The harbour at Gary, Indiana, is a private enterprise, constructed solely for the service of the Indiana Steel Company. At Buffington, Indiana, a harbour has just been completed which is being used in a similar way by the Universal Portland Cement Company. At Indiana Harbour, Indiana, the United States Government has provided outer harbour works to protect the entrance to an artificial waterway known as the Indiana Harbour Canal, which was built by private enterprise and turned over to the Federal Government to maintain as a public improvement.

(To be continued).

French Harbour Affairs.

BUSY GRAVING DOCK.

As a result of the reduction in the charges for the use of the large dry dock at Havre by boats under 15,000 tons the dock has been in constant use.

HAVRE RAILWAY SYSTEM.

The Port Authority and the French State Railways have come to an agreement regarding the new railway facilities at the Quai d'Escale.

CONTRACT AWARDED.

After examining estimates submitted by eleven firms of contractors, the Port Authority has awarded Messrs. Camus and Company, of Havre, a £33,200 contract to provide passenger accommodation at "Quai d'Escale" No. 2 Berth, Port of Havre.

MARSEILLES CONTRACT.

On April 26th, a 240,000 francs contract was signed for the improvement of the "Anse des Auffes" at Marseilles Harbour.

ROUEN CONTRACT.

On May 8th, a 270,000 francs contract was awarded for repairs to the Seine left bank wall.

SPECIAL RAILWAY TARIFFS.

Reduced railway tariffs for Havre and Rouen timber have now been adopted as it was feared that the recent increase in taxes and railway charges would badly affect these two great timber ports.

The new tariffs are: Havre—Paris, Colonial timber 46 francs per metric ton instead of 97.90 francs; European timber 72.15 francs. Rouen—Paris, Colonial timber 34.10 francs per metric ton instead of 64.60 francs; European timber 52.45 francs.

A law passed on February 29th has also reduced the State duties on rail consignments, and it is urged that the same reduction should be granted to goods borne by water.

PILOTAGE LAW.

On March 15th, the French Senate approved the Pilotage Law passed by the "Chambre des Depute" in July, 1927. This law brings very little change to Pilotage Regulations now in force at the French Ports. Captains of French vessels will not be allowed to act as pilots as had been suggested.

ATLANTIC MEDITERRANEAN CANAL.

Senator Feuga is to ask the Minster of Public Works to examine the possibility of using German reparations in kind under the Dawes Plan, for the construction of a canal for large seagoing vessels, joining the Atlantic to the Mediterranean, as this achievement would be a great boon to navigation; the already existing canal which unites the two seas can be used only by small barges.

HAVRE NAVAL REVIEW.

At the beginning of July, a review of all available vessels of the French Fleet is to be held at Havre in the presence of President Doumergue. The French Mediterranean Fleet leaves Toulon at the end of May to attend this review, and after manœuvres with the Brest Fleet will visit the French Atlantic ports in the second half of June. After staying a week at Havre the Mediterranean Fleet will visit the Channel ports.

INCREASE IN TRAFFIC.

The use of Havre as a port of call by the White Star Line for its new Havre—Southampton—Canada service will take the "Megantic" and the "Albertic" away from Liverpool.

The new service is expected to start very shortly. Traffic to and from the Canadian Dominion is steadily increasing and both Southampton and Havre are likely to share in this improvement.

Cunarders are also calling again at Havre and for the third year in succession the weekly service to New York will be maintained by the cabin-class sister ships "Caronia" and "Carmania," supported by the "Lancastria" and "Tuxania."

On most of the sailings these steamers will call at Havre and Southampton in the reverse order to previous years. That is to say, the west bound route will now be from London to Southampton and Havre and thence to New York direct, thus shortening the voyage from the French port by about twelve hours. Eastbound, these steamers will continue to call at Plymouth, Havre and London.

ALGERIAN PORTS.

His Majesty's Consul-General at Algiers has furnished the Overseas Trade Department with a copy of "Documents Statisques du Port d'Alger, 1927-1927," published by the Algiers Chamber of Commerce and which has recently been issued. Inter alia, statistical details are given as to imports and exports, the coal trade and the movements of shipping. The publication can be personally consulted at the City office of the Department (Shipping and Transport Section), 73, Basinghall Street, London, E.C.2.

American Harbour Personalities.

I.—MAJOR-GENERAL WILLIAM SIBERT.

One of the most splendid public administrative accomplishments in America is the completed State port project at Mobile, Alabama. It is a monument to the engineering skill, the tact, diplomacy and practical efficiency of one man, for on this one man's shoulders was the responsibility for creating an adequate public terminal which would put a stop to the gradual decadence of Alabama's only ocean outlet, and enable that port to meet the competition of its rivals. The sum to be spent was $10,000,000, which is by no means an impressive amount for the purpose, even though a large sum to a community which had always depended on private initiative to maintain all waterfront services.

The man selected to spend that money, and to see to it that the State of Alabama and the Port of Mobile received full value for the expenditure, was Major-General William L. Sibert, a native of the State and already one of the nation's most distinguished engineers. The great plant has been completed and is in active operation. Whether or not it may be called the crowning achievement of an intensively active life must be left to the point of view, for General Sibert is a man of just such varied achievements as might be the ambition of any Army engineer—achievements of a variety that probably only an officer of the Engineer Corps could aspire to. From the beginning of the Mobile port project, General Sibert has been the chairman, chief engineer and general manager of the Alabama State Docks Commission. In practice he has been all that the titles indicate—the administrative, the engineering, the operating head—and there has never been, in any respect, the least doubt as to whose genius rules or whose judgment predominates. It is interesting to consider what his career had been, which led to his selection for this task.

Born at Gadsden, in 1860, General Sibert, after two years at Alabama State University, entered the United States Military Academy, from which he was graduated with honours in 1884. In 1887 he was graduated from the United States Engineers School of Application. As a first lieutenant of engineers he was engaged in river and harbour work in Kentucky from 1887 to 1892, on the Sault Ste. Marie Canal from 1892 to 1894, and in river and harbour work in Arkansas from 1894 to 1898, having been promoted to captain in 1896. He was for a year instructor at the Engineers' School of Application, then spent a year in the Phillippines as chief engineer of the Department of the Pacific, and of the Eighth Army Corps, serving also as chief engineer and general manager of the Manila and Dagupan Railroad. He received the highest commendation for the manner in which he performed the duties of these offices, and was returned to the United States in 1900 and placed in charge of improvements in the Ohio, Allegheny and Monongahela Rivers, including the construction of 15 locks and dams, and maintenance and operation of 14 which already had been completed. He was a member of the board that formed the 9 ft. project for the Ohio River, and made the argument which caused Congress to adopt this project, involving the expenditure of nearly $100,000,000. There are those who might, with good reason, claim this as his greatest achievement.

From 1907 to 1914 General Sibert was a member of the Isthmian Canal Commission, and, as division engineer of the Atlantic division of the Panama Canal, had charge of the construction of the Gatun Locks and Dam, of the seven miles of canal from Gatun to the sea, of the Colon Breakwater, and of the harbour excavations at Colon. The National Cyclopedia of American Biography says:—

"The building of the Gatun locks and dam was one of the principal engineering feats accomplished in the construction of the canal, and the selection of Major Sibert to direct the works was a tribute to his professional skill. The dam, composed largely of earth, was built on a soft, yielding foundation, across the lower end of the Chagres Valley, impounding the waters of the Chagres River and its tributaries, and forming a lake, 164 miles in extent, which constitutes a 28-mile section of the canal. To reach the level of the lake thus formed a flight of three locks, each 1,000 ft. long, 110 ft. wide, with a combined lift of 85 ft. was constructed . . . He received the thanks of Congress and was promoted to be a Brigadier-General for these services." This is a second achievement which might rank as his greatest, and the one by which he has been best known.

General Sibert was commander of the Pacific Coast Artillery District in 1917, and when the United States entered the War he was promoted to Major-General in command of the First Division, which he took to France as the first unit of the American Expeditionary Forces. The subsequent record of this, the most famous American fighting unit, is the finest tribute to the training it received under General Sibert. In January, 1918, he was returned to the United States for departmental services, and in May of that year was appointed director of the United States Chemical Warfare Service, which he organised. It is not pertinent here even to summarise the performance of this stupendous labour, involving the seven divisions of, administration, overseas, research, development, gas offence, gas defence, and proving, into which the service was organised. It was one of the greatest War tasks of America, and third of the conspicuously great achievements of this officer. He received the American Distinguished Service Medal and was made a Commander of the French Legion of Honour.

In 1920 he retired from the Army—as his service on the Isthmian Commission entitled him to have done many years before—and he was contentedly enjoying his farm, his fox hounds and his horses at Bowling Green, Kentucky, when a committee from his native State asked him to build the public port, which had been provided for by suitable legislative action. The Alabama State Docks Commission had been created in 1922, and, in September, 1923, an enabling Act provided for the sale of Alabama State bonds not exceeding $10,000,000 for promoting, developing, constructing, maintaining and operating a port or ports. In December, 1923, General Sibert came to Mobile, as a member of the commission of three, of

Major-General William Luther Sibert, U.S.A., retired.

which the other members were former Governor Charles Henderson and Mr. Frank G. Blair. He did not come until he had been given adequate assurance that the work would be kept entirely out of politics, and that he would have an absolutely free hand in the prosecution of the task. He was made chairman of the commission, members of which serve without pay, but also became an employee thereof in the capacities of chief engineer and general manager.

The only site peculiarly suitable for the development of the terminals was along the Mobile River, just north of the M. & O. Railroad wharves, and this site was not available unless the Louisville and Nashville Railroad's main line tracks could be moved landward some 2,000 ft. on a length of approximately three miles, a change which likewise necessitated rearrangement of the terminal yards of the Mobile & Ohio and Southern Railroads. Furthermore, property held by various owners had to be purchased, this amounting to 550 acres of swamp land, within the limits of the City of Mobile. Still further, before the property could be converted to port purposes, One-Mile Creek, which ran through the site in such a way as to injure it materially as a location for ocean terminals, had to be moved. In doing this, a diversion channel over a mile long was excavated, turning the waters of One-Mile Creek into Three-Mile Creek, and forming a canal wide enough and deep enough for barge navigation, thus opening up an extensive area for industrial purposes. These matters required about two years for adjustments and execution. They required negotiations of the most delicate character, and required the most careful procedure in respect to disbursements. The people of Mobile probably were more impressed by General Sibert's success in these directions than by any other of his activities.

The plan of procedure specified as paramount conditions that the terminals should be equally accessible to all railroads entering Mobile, and that they should be so arranged that vessels would find safe moorings thereat in the event of tropical storms, such as are likely to strike as often as once every ten years. All railroads were brought together in one

yard, wherein these railroads and the Commission have their receiving and interchange tracks. In accomplishing this, the Commission built five miles of rail line to the north-west to enable two of the roads to enter the yard and to provide a permanent means of entry for new railroads. There also was provided a classification yard, with a present capacity of 1,000 freight cars, convenient to the berthing spaces.

A pier and slip system, which provides shelter during storms, was adopted for the waterfront layout, the wharves being built on land, and the space between them being dredged out to accommodate the channel depth of 30 ft. The wharves were built higher than the highest hurricane tides. Three tracks are built on the pier aprons, with cross-overs at each ship berth, so that all cargo may be handled direct between cars and vessels (75 per cent. of Mobile freight demands this accommodation). The piers are 1,600 ft. in length and 560 ft. wide, with 350 ft. slips alternating between them. There are three of these piers, all of reinforced concrete. Shipside warehouses at Piers 1 and 2 cover 20 acres of storage space, exclusive of transit accommodations. Pier No. 3 is open for the handling of heavy freight and commodities which do not require shelter. The cotton warehouse adjoining Pier 1 is 230 ft. wide and 900 ft. long, with transit sheds, density press and all necessary equipment for handling this major commodity. This and all other warehouse space is of reinforced concrete construction, fireproof, and sprinklered. A modern coal-handling plant, available also for the handling of ores, gravel, phosphate rock, bauxite, etc., is being erected by the Commission; a 75-ton derrick has been installed on Pier 3, and locomotive derricks handling up to 25 tons will operate on the marginal tracks at all piers. A special wharf has been provided for river boat and barge landing, and many other special provisions have been made at this plant for accommodating all demands of ships or shippers.

Port of Grimsby.

Board of Trade Inquiry into Trawler Explosion.

A trawler which cost its owner £50 figured in a Board of Trade inquiry which was held at Grimsby on Wednesday and Thursday, May 16th and 17th, into the boiler explosion which occurred on board the steam trawler "Bessie" with fatal results, whilst that vessel was lying off Spurn Point on the night of November 8th last. Mr. George C. Vaux conducted the inquiry on behalf of the Board of Trade, and the Commissioners were Mr. Archibald B. Bence-Jones, barrister-at-law, and Mr. John McLaren, M.I.M.E., consulting engineer. Mr. Vaux said the parties concerned in the inquiry were Mr. John King, a boiler maker of Grimsby, and Henry Ibbotson, skipper and owner of the "Bessie."

The latter was built as a steam yacht in Lanarkshire in 1881, and the boiler concerned was put in by a Glasgow firm in 1886. Mr. Vaux traced the history of the "Bessie" until the time of her coming into the possession of skipper Ibbotson, who paid £50 for her from Mrs. Ellen Georgina Cribb. Immediately upon taking the vessel over, Ibbotson prepared her for sea and had certain repairs done to her. On November 8th, when she was going down the Humber, the first engine man on board called to the skipper and said that he could not get a vacuum, and asked if the vessel could lay to until he tried the boiler. He also said he wanted to cut out a "liner," and, for this purpose, skipper Ibbotson gave him an old corned beef tin. Five minutes later the safety valve was heard blowing, and a few minutes later there was a loud report. The boiler had exploded. Both engineers lost their lives. Upon examination, a ragged end was found at the firing end of the boiler. The "Bessie" was not insured.

Evidence as to repairs which were done to the boiler previous to the "Bessie" becoming the property of Ibbotson was called, John King, the boilermaker who was called in by Ibbotson to see to the boiler, said altogether he put in 64 new tubes. Ten were first put in, but, when 40 lbs. pressure was put on, others gave out. He did not examine the boiler for Ibbotson, as he was not instructed to do so. After the accident he saw the boiler, and saw a hole about two inches in circumference. The edges were ragged and the thickness of the plate at the edges of the hole was only 3-16ths of an inch. He described the boiler as being in the last stages of senile decay. Skipper Ibbotson, who gave evidence, said he understood that the boiler tubes formed the only trouble and, having had these attended to, he thought the vessel was fit for service. He knew about insurance, he said, and if he had had the means he would have insured the vessel.

James Patrick Turnbull, a Board of Trade surveyor, said he examined the hole. The plate on the outside showed signs of corrosion. Five studs were still in the plate round the hole, and they had evidently been cut or broken off. Apparently the hole had been made for a fitting, but there was no sign of any patch or fitting. The edges were ragged, and at one part there was evidence of a screw edge. Possibly a screw plug had fitted in the hole, and this may have gradually corroded. Then the place may have been covered with cement on the inside. When the cement was removed, the plug would no doubt be weakened further, and finally it would blow out. The boiler was in a very unsatisfactory state, and any competent surveyor would have noticed the weakness.

Giving judgment, Mr. Bence-Jones said it appeared that a vessel of this class—a trawler of about 40 tons gross—could be allowed to proceed to sea in an unseaworthy condition and with a boiler absolutely unfit for generating steam. The boiler was of extreme age, and was deteriorated to the uttermost. There was no record of any qualified inspection for years past. It was controlled by inexperienced people unversed in the technicalities of boilers. Owing to the ignorance of those on board, such a boiler as that which formed the subject of the investigation becomes a source of danger to those in charge of it. The circumstances appeared to call for periodical surveys of uninsured ships of this class. Two lives were sacrificed absolutely needlessly. Such periodical surveys should be held by qualified surveyors attached to some corporate body invested with powers which do not at present exist.

Answering the questions put to the Court by the Board of Trade, the Commissioner said Mr. John King, the boilermaker, who was called in by Henry Ibbotson, the skipper and owner of the "Bessie," did not make any examination of the boiler, not being authorised to do so. He only carried out his instructions. They considered that the evidence showed that King guaranteed his own work only, as the general condition of the boiler was not within the scope of his work. The boiler was not examined by a competent person after Ibbotson acquired it, and he never took steps to see if the boiler was able to stand the pressure it would be subject to. Coming to the cause of the explosion, the Commissioner said that they found the cause was waste due to age and corrosion which had reduced the thickness of the shell plates, which were too weak to withstand the pressure to which the boiler was subject. As regards the last question as to who was responsible for the occurrence, either John King or skipper Ibbotson, the Court found there had been negligence which led directly to loss of life, and Ibbotson was alone to blame for the explosion. The Court ordered him to pay £50 towards the cost of the inquiry.

Launch of S.S. "Waterton."

New Steamer for Canadian Lakes.

The s.s. "Waterton," the second of the two Canadian Lake Steamers built for service on the Great Lakes, canals and River St. Lawrence, ordered by Mathews Steamship Co., Ltd., in January last, from Sir W. G. Armstrong Whitworth & Co., was launched from the Armstrong Yard on April 23rd. The launching ceremony was gracefully performed by Mrs. Henry Muras.

The principal dimensions of the vessel are: Length overall, 259 ft. 6 in.; length between perpendiculars, 253 ft.; breadth moulded 43 ft. 6 in.; depth, moulded, 21 ft. 6 in. The vessel is designed to carry 2,350 tons on 14 ft. draft.

She is built to Lloyd's class, and is of single deck type with poop and forecastle. Two masts, two derrick posts and four derricks are fitted. A steam windlass is fitted on the forecastle deck and two warping winches and four cargo handling winches are also fitted. The steam steering gear is of the Wilson-Pirrie type.

Accommodation is provided in and above the forecastle for the captain, officers and crew and the engineers and firemen are housed in steel deckhouses on the poop deck alongside the machinery casings. The vessel is electrically lighted throughout.

The main propelling machinery, which has been manufactured by Sir W. G. Armstrong Whitworth & Co., Ltd., at their Marine Engine Department, Scotswood, consists of triple expansion engines having cylinders 17 in., 28 in., 46 in. and 36 in. stroke.

There are two cylindrical multitubular single-ended boilers 12 ft. 6 in. diameter and 11 ft. long and worked at a pressure of 200 lbs. The boilers are fitted with "Reliance" patent fan draught system with all the latest improvements and are arranged for coal burning.

The construction of the vessel has been carried out under the personal supervision of Mr. John Dunlop, of Messrs. John Reid (London), Ltd. The s.s. "Waterton" is a sister ship to the s.s. "Livingston," which was launched from the Armstrong, Whitworth Shipyard on the 3rd April.

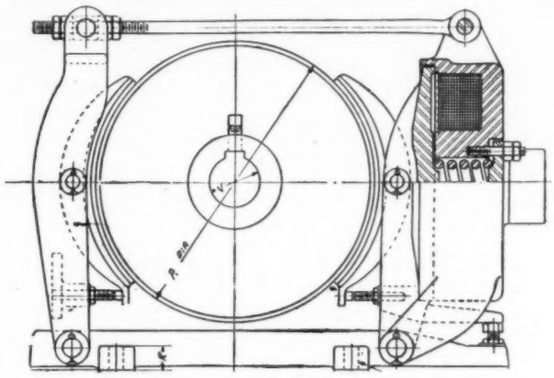
CRANE DUES AT BREMERHAVEN.

The Department of Overseas Trade has received from His Majesty's Consul at Bremen a statement showing crane dues at present in force at Bremerhaven. Particulars have been issued to steamship owners and brokers on the Department's Special Register, and copies may be obtained by companies of British origin, capital and control upon application to the City office of the Department (Shipping and Transport Section), 73, Basinghall Street, London, E.C.2.

Harbour Engineering Notes.

MAGNETIC BRAKES FOR CRANES.

One of the most essential features on any dockyard crane or hoist is the brake, and, during recent years, the introduction of the magnetically-operated brake has given dockyard engineers a dependable means of ensuring braking devices that will hold and with an almost hair-line accuracy. These brakes are made for both direct and alternating current service, they fit into a remarkably small space and require very little headroom and their water-proof, sturdy construction ensures a high working efficiency and a low maintenance cost.

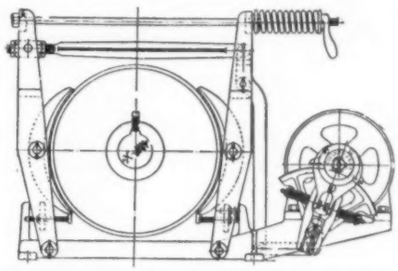


Type M Brake, designed for direct current service.

The brake designed for direct current service is the Type M, in which the operating magnet acts directly on the brake shoe. The armature of the electromagnet is an integral part of the brake shoe arms. The magnet field is connected to the opposite shoe arm by a rod which passes over the brake wheel. When the brake is applied, the armature and field are forced apart by a spring situated in the centre of the magnet field, and the brake shoe attached to the armature is forced against the wheel. At the same time the magnet field pulls the opposite shoe against the wheel.

In other words, each shoe moves the same distance and in exactly the same direction as the part of the magnet to which it is attached. As the action and reaction of the armature and field are bound to be equal, equal forces are exerted on the two shoes and a positive even braking action is obtained in either direction of rotation of the brake wheel.

The electromagnet of the Type M brake is designed for a short stroke so that direct action on the shoes is possible. The total movement between the armature and field need be only enough to provide clearance btween the brake shoes and the wheel when the magnet is released. The maximum magnet travel of the Type M brake need not be over 0.08-in. or 0.04-in. for each shoe. Since the parts move through such short distances the time of action is extremely short. On setting there is a quick steady pressure, which brings the machine to rest in the shortest time consistent with safety. On release, there is no dragging of the brake shoes as the motor gets under way and therefore there is no undue wear on the brake shoe linings.



Type R.S. Brake, for alternating current service.

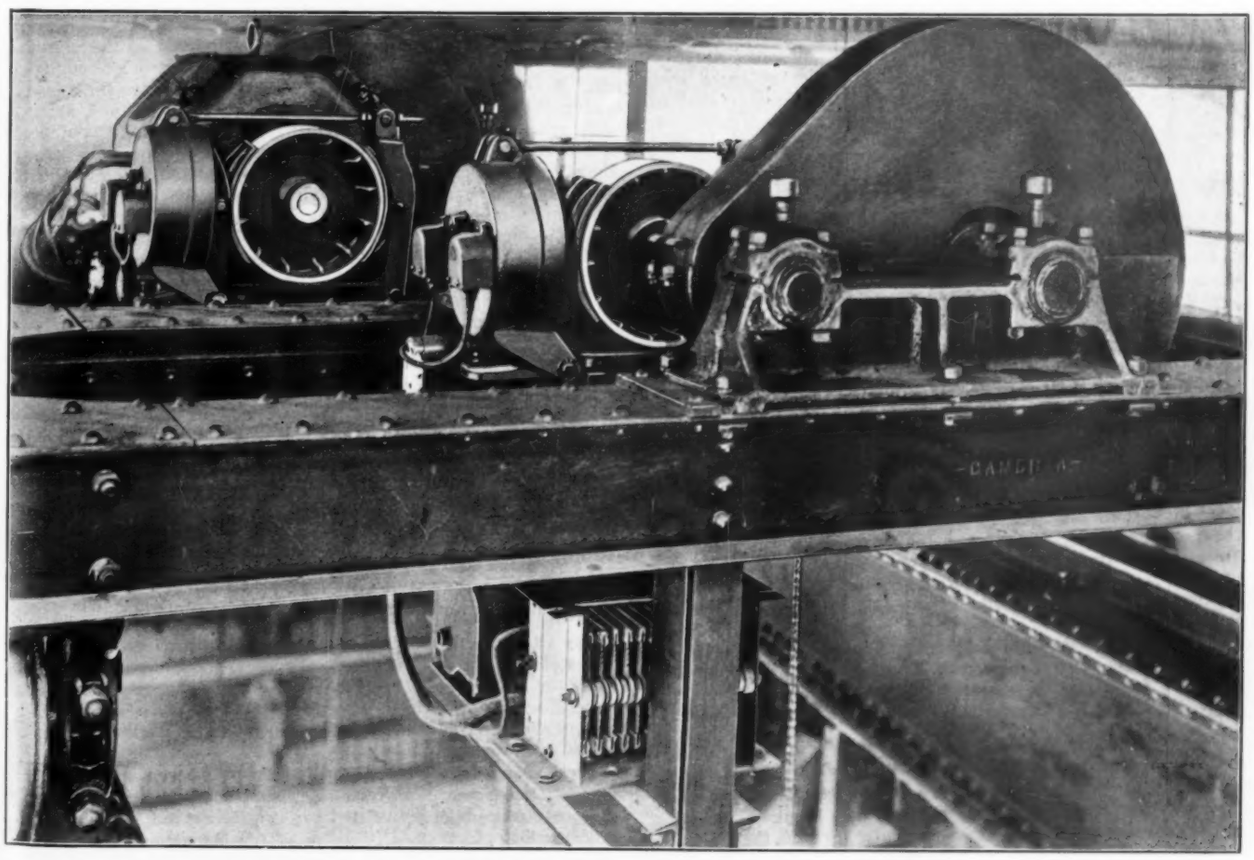
The intensity of the braking force is regulated by varying the compression on the large spring in the centre of the field. Adjusting nuts are placed between the terminals at the back of the magnet case for this purpose. Adjustments for wear on the brake shoe lining are made by varying the length of the tie rod above the brake shoe wheel. The clearances between the brake shoes and the wheel are equalised by regulating a stop placed below the magnet case. The construction of this brake will be easily understood from the diagram in Fig. 1.

For alternating current service, the Type RS brake is employed. These brakes are operated by a rotating magnet, equivalent to a high torque squirrel cage motor. For this reason they possess a number of interesting advantages. The adoption and development of the rotating magnet in place of the ordinary solenoid or clapper magnet has produced an a.c. brake whose reliability is unquestioned. The rotor works through a pinion and a toothed sector to which a lever is attached. This lever spreads the brake arms and releases the brake shoes as the rotor revolves. It requires only one and a half revolutions to release the brake, after which it stalls and holds the brake in the released position until the control switch is opened.

On applying the brake, a heavy helical spring forces the brake shoes against the wheel, the small ball-bearing rotor offering no appreciable resistance.

BEARING THERMOSTAT RELAYS.

A most useful device for preventing the bearings of machinery from becoming overheated is the bearing thermostat relay,



Trolley of a 10-ton Travelling Crane, showing the 14-in. Type M Brakes and Resistance for Palmer Limit Stop.

which, during recent years,has been brought to a very high degree of perfection. The latest type of this device is placed in the bearing cap of any machine in such a manner that the lower end, which is of babbitt metal and houses a thermal element, is in direct contact with and bearing upon the revolving shaft, so that any heat generated by the shaft is conducted directly and immediately to the thermal element. If the heat becomes excessive, as would be the case with improper lubrication, the thermostat relay comes into operation, opening one electrical contact and closing another. The relay may, therefore, be used either as a circuit-breaker or a circuit-making relay to work any form of signal or protective device for shut ting down the machine in which the trouble has developed.

The thermostat relay consists essentially of a bulb containing a volatile liquid in contact with the babbitt seat on the shaft. The temperature at which the volatile liquid vaporises depends upon its composition, though in the standard type the relay will operate at 90 deg. C. The bulb containing the liquid is contained in a heavy copper tube, the whole being enclosed in a brass tube, so that a path of high thermal conductivity from the shaft to the liquid is formed, an air space surrounding the tube is provided which prevents the dissipation of heat and makes any excessive heat generated by the shaft at once effective.

When the shaft becomes too hot, the liquid vaporises, forcing the liquid up a tube into an element in a form of bellows constructed entirely of sheet copper, which, under pressure from the liquid, expands and raises a latch, which serves to make or break a contact. Thus, in the case of expensive machinery, if lubrication of the shaft becomes defective, which it sometimes does, notwithstanding the most expert supervision, this relay comes into operation when the temperature of the bearings has become too high, and either rings a bell, lights a lamp or other signal, or cuts off power to the machine involved.

ACCELERATING TRAMCAR SPEEDS.

A system has recently been perfected by means of which tramcar speeds may be more quickly accelerated and a higher schedule speed maintained without undue wear on the motors and other parts, and also permitting the employment of smaller cables and feeders. As is well known, much time is wasted on tramcar systems in traffic blocks and in stopping to pick up passengers, which time, if not permanently lost, has to be made up by extra speed when the car gets a clear run.

The device referred to, which is known as the "Auto-Shunt," consists of a relay and double pole contactor with the requisite resistances for field shunting. For the adoption of the system, very little alteration of the existing control on tramcars is necessary, and this can be effected at depots.

Some tests with this system were recently carried out on the cars of the Metropolitan Electric Tramways, Ltd., it was found that on a non-stop run of one mile, while the motor required 8 per cent. more power with the shunt than without, the average speed was increased by 13 per cent. In the case of another car, the power was increased by only 3.8 per cent., while the average speed was raised by 12.4 per cent. On two other cars, without shunt system, the maximum speed was 26 m.p.h., while with the "Auto-Shunt" it was increased to 30 m.p.h. in one case and 32 m.p.h. in the other. The device is also applicable to storage battery vehicles, such as industrial locomotives, air compressors and hoists.

NEW MOTOR STARTER.

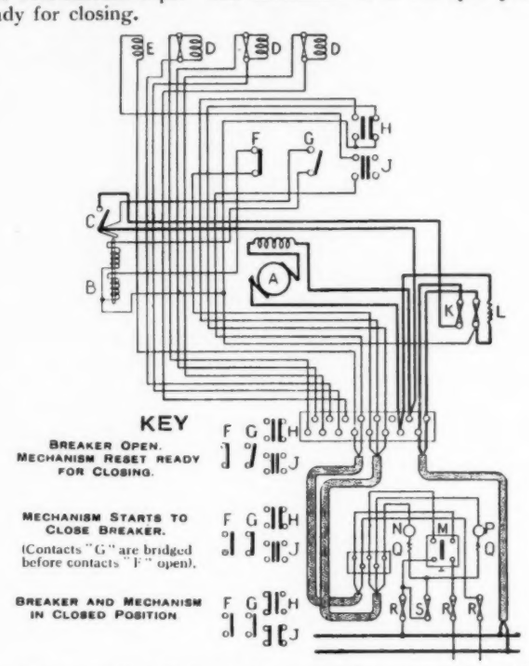
A new development which will be of interest to all users of small squirrel cage induction type motors up to 5 h.p. is the "AAA" starter recently placed on the market by the Igranic Electric Co., Ltd. This new motor starter is a complete automatic starter of the across-the-line type, and is equipped with an accurate and consistent thermal overload relay which affords protection to the motor windings, while at the same time permitting loading of the motor to its full capacity. Owing to its small size, it is possible to mount the starter immediately at the operator's position in the place usually occupied by push button stations. The push buttons are on the front cover of the case, so that the "AAA" is a complete automatic starting unit in itself. Control of the starter, however, is not confined to the use of the push buttons on the case; one or a number of push buttons may be placed in any convenient positions. Apart from its small size and the protection it affords, an interesting feature of the starter is the design of the contactor mechanism. The usual butt type fingers have been replaced in this starter by simple rollers which close the circuit between two stationary fingers, so that when the rollers are withdrawn the circuit is broken in two places. As each operation of the contactor turns the roller slightly, a new and clean surface is presented for the next operation.

DOCKYARD ELECTRICAL DISTRIBUTION.

One of the most interesting devices for the electrical control of oil-immersed circuit breakers on distribution systems is the centrifugal mechanism, which is a motor-driven device primarily designed for closing oil-immersed circuit breakers where a supply of direct current is not available, but they can be equipped with either d.c. or a.c. motors. The motor revolves a pair of weights, the centrifugal force of which operates through a suitable mechanism and exerts the required pull for closing the breaker. The complete operation, from the time of closing the motor circuit, is timed to give the best results.

The construction of the device is as follows: A vertical shaft carrying a pair of hinged flyweights is mounted between ball-bearings on a rigid cast iron frame. The shaft is arranged to be rotated by the motor through a self-aligning coupling, and the centrifugal force exerted by the fly-weights revolving at high speed is transmitted through a thrust-block and a system of levers to the closing mechanism of the breaker. A relay switch is provided to open and close the motor circuit, and is operated by a control relay upon which it is mounted.

The sequence of operation can be followed by reference to the diagram (British Thompson-Houston Co., Ltd., the inventors and manufacturers), which shows a typical connection diagram of a centrifugal mechanism with a shunt trip and three a.c. over-current trips. The mechanism is in the open position ready for closing.



Typical connection diagram of a centrifugal mechanism, with a shunt trip and three alternating current over-current trips (British Thomson-Houston).

a Motor. *b* Control Relay. *c* Relay Switch. *d* Over-current Trip Coils. *e* Shunt Trip Coil. *f-g* Relay Circuit Contacts. *h-j* Auxiliary Switch. *k* Motor Circuit Fuses *l* Series Resistance. *m* Control Switch *n* Green Indicating Lamp. *p* Red Indicating Lamp. *q* Indicating Lamp Resistance. *r* 10 Ampere Fuse. *s* 3 Ampere Fuse.

When the breaker control switch M is moved to the closed position, that is towards the left, the closing coil of the control relay B is energised and the relay switch C completes the motor circuit. The mechanism then commences to close, and at an early period of the closing movements, the relay circuit contacts G are bridged, thus energising the relay retaining coil. Disconnection of the closing coil follows immediately by breaking the relay circuit contacts F. This allows the control switch to be released before the breaker is fully closed.

As the motor runs up to speed, the thrust-block attached to the lever system is pulled down with increasing force until the closing stroke is completed. The mechanism is then automatically latched in the closed position, and, simultaneously, the relay retaining coil is de-energised by breaking the relay circuit contacts G.

The arrangement of the relay circuit contacts and their movement relative to any period of the closing stroke is such that the motor is prevented from running continuously should the circuit breaker trip on a fault during the closing operation. The speed of closing is also quite independent of the operation of the control switch.

After the breaker has been tripped either by hand or due to a fault, the centrifugal mechanism is mechanically reset by a powerful adjustable resetting spring so that a repetition of the closing operation can be made.

CHARGES AT WESER PORTS.

The Department of Overseas Trade has received from His Majesty's Consul at Bremen schedules showing the revised rates for discharging and tallying at Bremen, Bremerhaven and Wesermunde, which were brought into force on the 1st May, 1928, in consequence of an increase in dock labourer's wages.

Details have been circulated to steamship owners and brokers on the Department's Special Register, and copies may be obtained by companies of British origin, capital and control, upon application to the City office of the Department (Shipping and Transport Section), 73, Basinghall Street, London, E.C.2.

Harbour Structures.

I.—Preservation and Deterioration of Materials.

By WILLIAM G. ATWOOD, Consulting Engineer New York.

The problem of protecting harbour structures and vessels as well from deterioration is one which has faced the engineer since the days when men first made use of waterways for transportation purposes. The same agencies which cause deterioration of harbour structures also shorten the life of floating equipment of all kinds. So far as results are concerned the attack of a destructive organism on the piles in a wharf, the landing stages of Liverpool or the hulls of a ship is the same. Materials of construction and methods of protection available for one use are frequently not satisfactory for the other. It should be borne in mind, however, that the problems and the destructive agencies are the same, but the methods of solving them and of protection must, in many cases, be different in the two branches of the maritime art.

It will be possible in these discussions to consider only the problem of harbour structures. These structures may be built of stone or brick masonry, metal, concrete, timber, or a combination of two or more of them. Each of these construction materials has different openings for deterioration, their costs in place are very different, and the service and life required vary with the purpose of the structure and the local conditions. Careful consideration of these and other factors is required for the most economical and efficient design. While a granite masonry structure, for example, may promise the longest life of any available material, its first cost may be so high and the probable time before obsolescence so short, that an engineer should adopt some cheaper and less permanent material for his structure.

The designing engineer must be something of a prophet in order to set a time when the proposed structure will become obsolescent and select the construction material accordingly. The useful life may range from that of a rubble masonry wharf at Puzzoli, Italy, said to be 2,000 years old, to an unprotected timber pile structure in a tropical harbour which will not even last a year.

It will be the purpose of these articles to discuss these various construction materials and to indicate the causes of deterioration and methods of protecting them, with the hope that some assistance may be given to the engineer upon either to design, build or maintain such structures. Each of these materials has certain advantages and disadvantges which may be set down as follows:—

MASONRY.

Advantages.—Great durability if the stone and cement are of good quality; can carry great weights; maintenance cost low; fireproof. (Re-arrangement of facilities can be made without sub-structure alterations).

Disadvantages.—High first cost and consequent big interest charge; great weight requiring expensive foundations; rigid; inflexible and expensive to make alterations as requirements change; possibility of deterioration because of chemical or animal attack on either stone or mortar; probability of obsolescence before expiration of service life.

METAL.

Advantages.—Durability in the case of cast or wrought iron and possibilities in the future for alloy steel; has considerable salvage value; possible flexibility of design; ease of repair in case of damage greater than masonry; can be reconstructed more easily than masonry; maintenance cost moderately low in case of wrought and cast iron; highly fire resistant.

Disadvantages.—Generally an expensive type of construction; difficult to design without extravagant use of metal; rigid; subject to corrosion both above and below water level in both fresh and salt water; cast iron is brittle and easily broken by shock or impact.

CONCRETE.

Advantages.—First cost lower than for either of two preceding classes of material; lends itself to great flexibility of design; has long life if well built with proper materials; maintenance cost not excessive if structure is well built; fireproof.

Disadvantages.—Moderately expensive as compared to timber; rigid; expensive and difficult to repair if seriously damaged; in the present state of knowledge an uncertain material from the standpoint of durability.

TIMBER.

Advantages.—Low first cost; permits great flexibility of design; produces an elastic structure well fitted to resist shock without damage to vessels; easily obtained in most localities; has moderately long life if properly built and protected; repairs relatively easy to make.

Disadvantages.—Subject to damage by decay above water level and by marine borers below; relatively inflammable; requires constant maintenance.

Masonry lends itself only to the quay or solid fill type of construction; metal to open type pile construction; concrete to either solid fill or pile construction; and timber principally to pile construction, though it is used in the Maritime Province of Canada and in some other locations for the quay or solid fill type. Combinations are possible as in the case of New York, where many piers are built on timber sub-structures with concrete superstructures and steel wharf houses.

In succeeding articles these various materials will be considered in detail, and a discussion of the various methods of protection will be presented.

Trials of the S.S. "Scottish Chief."

Successful Results of New Single-screw Oil Tanker.

The single-screw steam oil tanker "Scottish Chief" built to the order of Messrs. Tankers Limited, by Sir W. G. Armstrong Whitworth and Co., Ltd., completed her final official full speed trials at sea under fully loaded conditions on May 4th, with satisfactory results. The speed obtained was in excess of that guaranteed.

The vessel is built on the longitudinal system, under special survey by Lloyds for their highest class, and has a length overall of 455 ft. with a moulded breadth of 56 ft. 8 in., and was designed to carry 10,000 tons dead weight, at a speed of 11½ knots per hour.

The main propelling machinery, which was made by the Marine Engine Department of Sir W. G. Armstrong Whitworth and Co., Ltd., consists of a single set of inverted, direct-acting surface condensing quadruple expansion engines, of modern design, and capable of developing 3,300 I.H.P.

The steam is supplied by four water type boilers working at a pressure of 250 lbs. per square inch, and having a super heat of 100 degrees Fahr. at the boiler stop valve.

All boilers are oil fired with air heated fronts, designed to work with a closed duct system of forced draft, complete with all necessary air trunks, casings, etc., and capable of delivering air at furnace fronts at 220 deg. Fahr. to 240 deg. Fahr.

The owners were represented on the trials by Mr. A. W. White, director of the firm and Mr. H. Hudson, superintendent engineer, and the builders by Mr. James Stewart, managing director of the Armstrong Shipyards and Colonel Hitchins, director.

Swedish Shipbuilding.

Motor Tankers at Goeta and Eriksberg Yards.

A motor tanker of 11,000 d.w. has been ordered of Goetaverken for the new shipping company, Transmark, Gothenburg. The new tanker, the sister ship of which is being built at Goetaverken, for Rederei A.B. Transcoil, Gothenburg, is 440 ft. long between p.p., has a 50 ft. beam and 35 ft. height moulded to main deck.

The longitudinal bulkheads and the transverse bulkeads form eight centre tanks and on each side four full height wing tanks. The propelling machinery, consisting of two 7-cylinder 4-cycle single-acting Gœtaverken B. and W. Diesel motors, each developing 1,950 i. h.p., at 155 revs. per minute will give the tanker a speed of 11.5 knots. She will be completed by the end of next year. The Goetaverken have orders in hand for motor-tankers amounting in all to 57,000 tons d.w.

At the Eriksbergs Mekaniska Verkstads Aktiebolag (The Eriksberg Mechanical Works) Gothenburg, a 90,000 tons d.w. motor-tanker ordered by the Rederei-Aktiebolaget Reut, Gothenburg, has just been launched, and on the same day a sister ship, the m/s "Markland," has been delivered to the Skibsaktieselskapet Markland, Bergen (Norway). The principal dimensions of the two ships are: Length between p.p., 407 ft., breadth moulded 55 ft., depth moulded 32 ft. The Swedish ship, named "Gustaf E. Reuter," will be a tanker with steam driven auxiliaries except for the steering engine, which is electrically driven, while the m/s "Markland" has all her auxiliaries electrically driven. The machinery placed aft consists of two six-cylinder Diesel engines developing together 2,800 I. H.P. as main motors and three auxiliary Diesel motors, all of Eriksberg make and Burmeister and Wain type. There are 16 tanks, of which eight are centre tanks with four wing tanks on each side. Besides these two ships the Eriksberg Works have orders for seven more motor ships and one steamer.

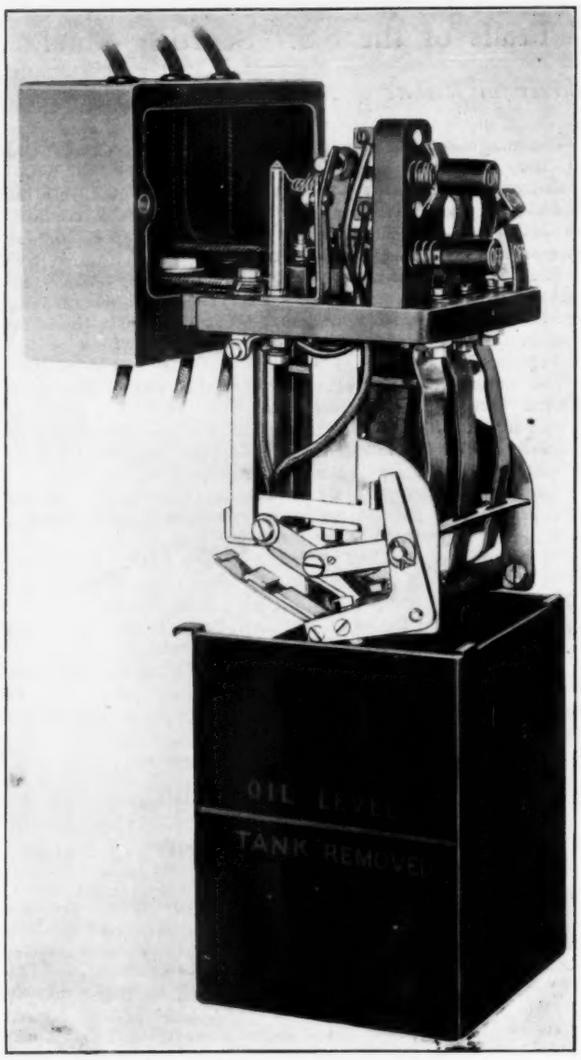
ARMSTRONG WHITWORTH.

We are officially informed that The Right Honourable the Earl of Verulam, who joined the Board of Sir W. G. Armstrong, Whitworth and Company, Limited, recently, has been elected Chairman of the Company. Lord Verulam succeeds Lord Southborough, who will continue on the Board.

The British Industries Fair.

First Exhibition of New Electrical Plant.

One of the most interesting sections at this year's British Industries Fair was that devoted to electrical plant, both for power and lighting, including a range of alternating current and direct current motors of the same ratings, identical in all essential dimensions. Such a feature is, of course, of importance to makers of machines to standardised dimensions, as it is a matter of simplicity to design machines so that either a



Oil-immersed Circuit Breaker in Small Tank.

d.c. or an a.c. motor of equivalent rating can be fitted as required. These motors are of both the horizontal and vertical types and are being built to run at any angle, a roller bearing being fitted at the driving end, where the load is greatest and a ball bearing at the other end. In the motors constructed for running vertically, the skirt base casting is separate from the end-shield casting, so that manufacturers of machinery can easily fit their own adaptor rings or adapt the motors for such service as pump driving.

The motor control gear covers a very wide range for both d.c. and a.c. motors, the points worth noting by manufacturers being the ease of installation and maintenance, reliability in use and safety to the operator. Starting equipments of the pillar type for floor mounting, fixing to walls or attaching to the frames of the machines they control are all shown.

An interesting equipment shown at the Fair, which has only recently been introduced, is one for non-reversing slip-ring motors up to 30 h.p. at 600 volts. This equipment provides over-current and under-voltage protection and is so connected that the motor can be stopped from any convenient point by means of a push button.

A new form of control gear, exhibited for the first time, is the B.T.H. ironclad, oil-immersed triple-pole thermal circuit breaker with "On" and "Off" push button control. This type of circuit breaker is primarily designed for use in connection with three phase induction motors on circuits up to 660 volts, and has been designed with the object of providing a cheap and reliable form of protection which will enable motors to carry heavy overloads for short periods, but will disconnect them on sustained overload as well as on any irregularity developing in connection with either the supply of current or the motor. A momentary starting currrent of five or six times the normal currrent is safely carried without the breaker tripping, but no overload can persist for a sufficiently long time to cause injury to the motor insulation by overheating. Further, an open circuit on one phase will cause the breaker to trip before the motor can become overheated by running single phase, and in the event of a short-circuit occuring in the motor windings or leads the motor is immediately disconnected.

These equipments have been designed to be as compact as possible, the 30 ampere size, for example, being only 8¾-in. by 7⅝-in. by 6-in. The mechanism is mounted on an insulating base fastened to a connection chamber in which there is room for the various types of cable in industrial use. The oil tank is attached to the cable connection chamber, and is also held in place by a metal top cover. Both the moving and fixed contacts are of the contactor type, renewable sparking tips being fitted. Contact is made with a wiping action and no arcing takes place on the contact faces when breaking the circuit. When required, a moving iron ammeter can be fitted on top of the cable connection chamber.

Control of the breaker is effected by "On" and "Off" push button switches with spring release, the switches being situated on the breaker base and push buttons mounted either on the breaker base or fitted at any number of distant points. They can also be incorporated in the rotor starter so that the breaker is closed automatically when the first contact is made on the starter. The breaker is closed by means of the "On" push button which completes the energising coil circuit. Operation of the "Off" push button switch disconnects the energising coil from the main circuit, which immediately releases the armature, and the breaker contacts separate with a quick break action.

Kiel Canal Traffic.

A report received by the Department of Overseas Trade from His Majesty's Consul-General at Hamburg states that traffic through the Kiel Canal during the month of March was exceptionally heavy. The canal was used by 4,003 vessels aggregating 1,261,632 n.r.t. There was thus an increase of about 750 vessels aggregating about 200,000 n.r.t. over the same period of last year.

Compared with February there is also a marked increase of about 300 vessels aggregating 200,000 n.r.t.

Of the 4,003 vessels constituting the total traffic 1,802 were registered as sea-going steamers aggregating 1,068,902 n.r.t. and 42 as sea-going motor vessels aggregating 61,113 n.r.t. Of these vessels 1,631 were cargo and passenger steamers aggregating 1,104,545 n.r.t., 123 were tugs aggregating 5,105 n.r.t. and 31 were steam traw'ers aggregating 2,137 n.r.t. In addition to these there were 1,930 sailing vessels aggregating 90,002 n.r.t. and 223 lighters and barges aggregating 41,547 n.r.t.

The vessels were loaded as follows:—Two with passengers; 129 with coal; 93 with stone; 74 with iron; 119 with timber; 554 with grain; 30 with cattle; 743 with ore and other goods in bulk; 1,029 with goods; 95 with general cargo; and 1,132 (28 per cent. of the whole traffic) empty or in ballast.

The cargoes increased in proportion to the general increase in traffic, the increase being especially noticeable in the shipments of stone, iron, grain and ore. There was, however, a slight decrease in the shipment of coal. Compared with February the trawler traffic showed a heavy decrease. The sailing vessels passing through increased considerably in number owing to better ice conditions.

Personal enquiries regarding all shipping and transport matters should be made at the City Office of the Department (Shipping and Transport Section), 73, Basinghall Street, London, E.C.2.

CANADIAN LAKE STEAMER.

The single-screw Canadian Lake steamer "Livingston," built to the order of the Mathews Steamship Co., Ltd., Toronto, by Sir W. G. Armstrong, Whitworth and Co., Ltd., recently completed her official trials at sea with satisfactory results.

The vessel and machinery were built under Lloyd's survey for their highest class; she has a length overall of 259 ft. 6 in., with a moulded breadth of 43 ft. 6 in., and is designed to carry about 2,350 tons dead-weight.

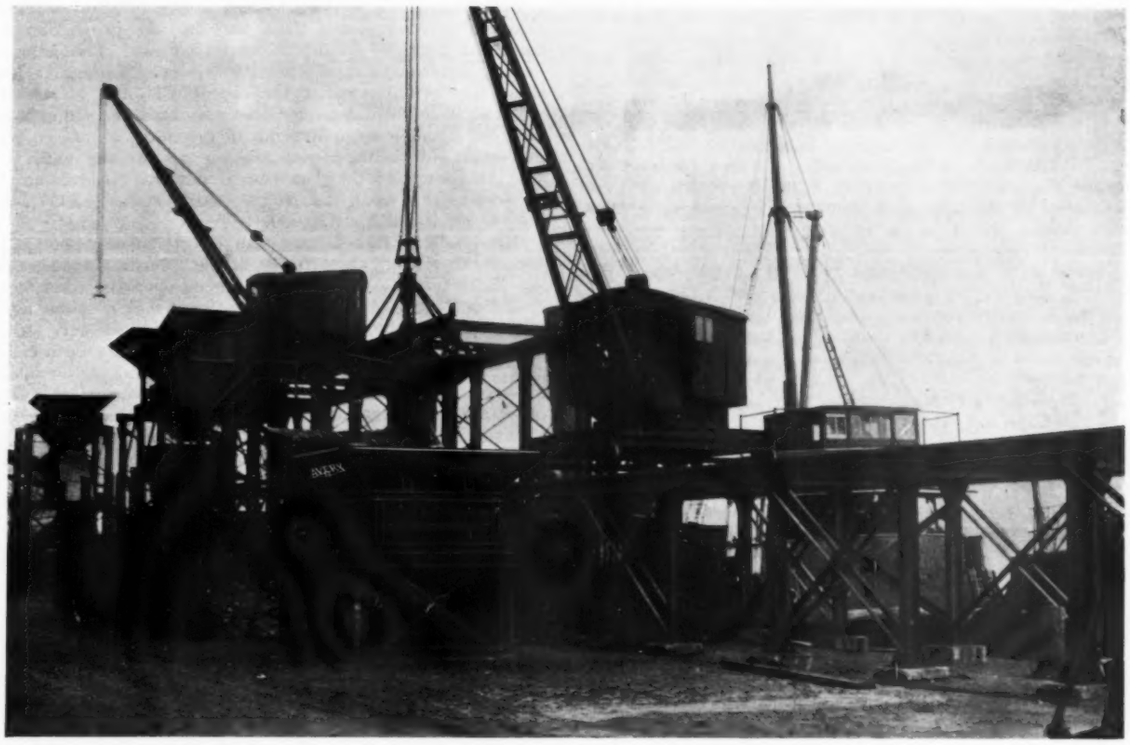
The main propelling machinery for the vessel, which was manufactured at the Scotswood Works of Sir W. G. Armstrong, Whitworth and Co., Ltd., consists of a set of triple expansion, surface condensing engines of modern design.

Steam is supplied by two cylindrical multitubular single-ended boilers, coal fired, working at a pressure of 200 lbs. per sq. inch, and fitted with fan draft, all made in accordance with plans furnished by John Reid (London), Ltd.

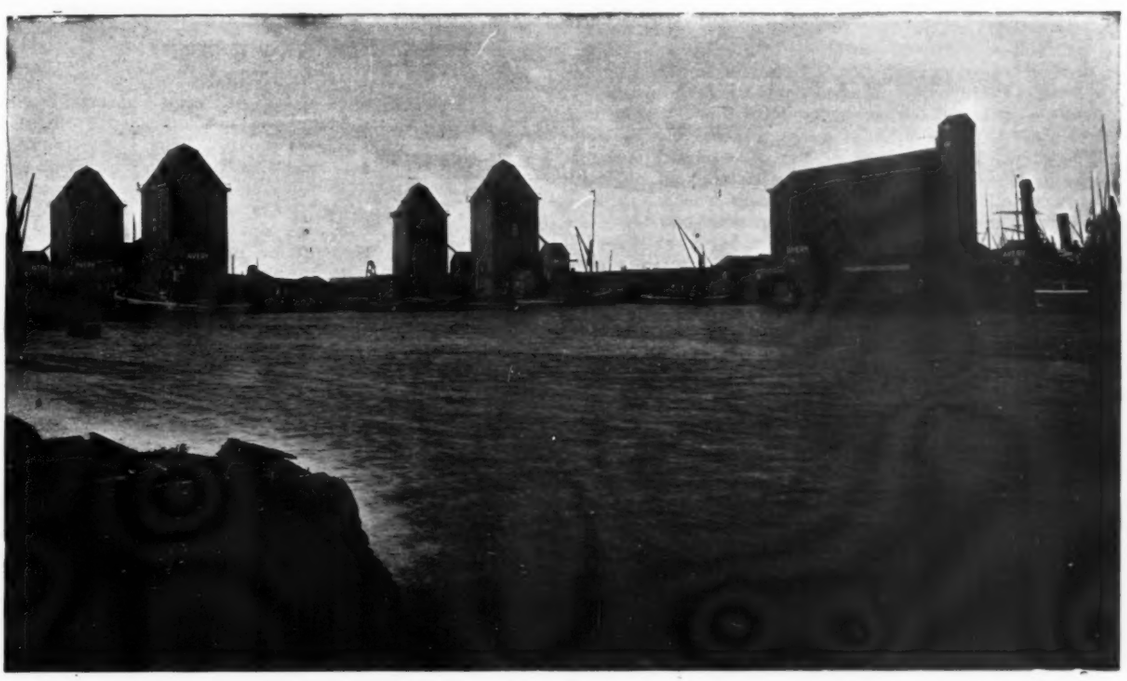
The construction of the vessel and the trials have been carried out under the personal supervision of Mr. John Dunlop, representing Messrs. John Reid (London) and Captain Andy Livingston. The builders were represented at the trials by Mr. J. W. Gibbesen, superintending engineer, and Mr. T. H. Matthews, manager of the marine engine department.

AUTOMATIC AVERY WEIGHERS

FOR COAL AND GRAIN



Two Avery Patent Automatic Hopper Weighers and Totalizers weighing Coal at a Gas Works.



"Avery" Automatic Grain Scales are installed in every building marked "Avery." Practically all the grain entering the Port of London is weighed over Avery Automatic Weighing Machines.

THE WEIGHINGS OF AVERY MACHINES ARE ACCEPTED BY THE CHIEF CORN TRADE ASSOCIATIONS, SHIPOWNERS, BROKERS, MERCHANTS AND MILLERS THE WORLD OVER.

W. & T. AVERY Ltd. SOHO FOUNDRY, BIRMINGHAM

Port of Southampton Topics.

RECLAMATION SCHEME.

One of the two biggest contracts in connection with the Southampton Dock extension scheme, being carried out on the western shore, has been placed with the James Dredging, Towage and Transport Co., Ltd., of Southampton and London. The contract provides for the reclamation of 170 acres, including the whole of the mudland—upwards of 100 acres—belonging to the Southampton Corporation. Approximately 10,000,000 tons of earth will have to be moved in connection with this contract. The work has already commenced and is expected to take about four years. The James Dredging Company were successful in obtaining the contract for the reclamation of about 18 acres near the Royal Pier when work on the scheme was begun. This preliminary work is fast approaching completion.

It involved the part dredging of the approach to the new quay and the utilisation of the more suitable spoil thus obtained for the construction of the reclamation bank and for the reclamation itself. The work to be done under the new contract will involve the dredging, to a depth of 35 ft. below l.w.o.s.t., of the remainder of the approach channel, the swinging ground in which vessels will turn on entering and leaving the port, and the berths alongside the new quay. About 3,000,000 tons of the spoil to be dredged from the bed of the River Test will be soft mud to be taken out to sea, and 7,000,000 tons will be the firmer materials to be used in the construction of the banks and for reclamation. The first piece of work to be taken in hand is the construction of a main bank along the southern, or seaward, side of the area to be reclaimed. Afterwards a secondary bank will be built at right angles to the main bank connecting the latter with the present foreshore, after which the reclamation of the areas enclosed by these walls will be proceeded with.

The main bank will be prolonged westward to join up with the bank now being constructed by the Southern Railway Company at Millbrook for the purpose of bringing the railway line from the main line to the new docks. The main bank will be made with a width of upwards of 150 ft. on top, so as to facilitate the construction of the new quay wall, which will be the subject of a further contract to be let in the near future, and in order that both that work and the reclamation can proceed simultaneously. The bank will be constructed on the method which has proved so successful in the case of the preliminary reclamation near the Royal Pier. The soft mud will be dredged away in the form of a grip, or channel, and the bank foundations will rest upon the firmer strata below. Selected dredged spoil will then be used to form the banks, which will be protected on their seaward side by brushwood fascines.

DREDGING DETAILS.

The spoil will be dredged from the bed of the river by bucket ladder dredgers into barges, in which it will be taken to the site required. There a special bank-building vessel will raise it by means of a bucket elevator, deposit it on to a travelling belt and place it in position. The firmer materials for reclamation purposes will also be dredged by bucket ladder dredgers into barges. It will be taken alongside vessels equipped with powerful reclamation pumps, which will pump it ashore through 30 in. diameter pipe-lines. Of these pipe-lines, about three miles will be required. The James Dredging Company will employ a fleet including some of the most powerful and up-to-date vessels extant. There will be three new powerful bucket ladder dredgers of 200 ft. in length and 36 ft. beam.

The dredging machinery of each vessel consists of triple expansion engines of 850 i.h.p., capable of dredging up to 1,500 tons per hour, even of heavy ground. For conveying the soft mud to the open sea, eight self-propelling, single-screw steam hoppers of 215 ft. length and 35 ft. beam, each with a carrying capacity of about 1,300 tons, will be used. These vessels, which have triple-expansion engines of 1,100 h.p., capable of giving a loaded speed of 10 knots per hour, are fitted for towing and will tow to sea the non-propelling hoppers, which vary in size from 500 to 2,000 tons capacity.

One of the most interesting vessels to be employed will be the new reclamation suction dredger, Foremost Chief, one of the largest and most powerful of her type ever built. This vessel will be 240 ft. in length and 50 ft. beam, and will be fitted with two pumps, capable of being worked singly or in series, by two sets of triple expansion engines having a total i.h.p. of 3,000. Four oil-fired marine type boilers will supply steam at 200 lbs. per square inch pressure. This vessel is expected to pump ashore through the 30 in. diameter pipe-line, at a distance of 2,500 ft., not less than 750 tons of dredged material per hour.

HARBOUR BOARD REVENUE.

The statement of accounts in regard to the work of the Harbour Board in 1927 gave general satisfaction when it was submitted at the last meeting of the Board. The net result of the year's working was a surplus of £30,356, against £28,605 in 1926, and this, together with £1,095 balance brought down from the previous year, made the total amount to be carried forward £31,451. Revenue on the Harbour accounts amounted to £60,096, the tonnage dues (£52,524) showing an increase of £1,557. There was an increase of £200 in the revenue from dues on vessels in Cowes Roads. Receipts from moorings (£2,059) were less by £120, and there was a decrease of £221 from ships lying up. An increase of £1,074 in expenditure in respect of buoys and beacons included over £500 for new moorings and beacons in Hamble River. Practically every source of revenue on the Town Quay account showed an increase, and the total revenue of £26,794 was £2,095 more than 1926. The Southampton Corporation's one-fifth share of the dues for the harbour amounted to £12,141, as compared with £11,268 in the previous year.

One member of the Board raised the question whether the increased revenue from dues was in fair proportion to the increased charges the Board had to meet. The amount the Board spent on dredging was well over £100,000, he pointed out. On capital account they spent £24,000, of which they received £10,000 from the Southern Railway Company, and they had spent a large sum out of revenue. He asked whether the increased tonnage was making up for the extra outlay. The chairman of the Finance Committee (Alderman F. A. Dunsford) said that the Board had overspent £117,540, but they owed the bank £20,000.

The Harbour Board have sent a very strong protest to the Mercantile Marine Department of the Board of Trade, concerning the proposals of the Air Council, with the consent of the Board of Trade, to make bye-laws for a R.A.F. bombing range at Calshot, on the entrance to Southampton Water. A resolution passed by the Board in 1920 has evidently been construed as a kind of permission in perpetuity for bombing to take place in a certain area, but the resolution giving permission was only of a temporary and provisional character. It is thought that the existence of a bombing range would constitute a serious menace to small craft even at the present time. The area covered by the proposed bye-laws is triangular in shape, and though it does not include any portion of the deep-water channel, the southern apex of the area is in close proximity to the channel at the point where ships pass to and from the Docks.

The Board, in their protest, have expressed the opinion that they should have been consulted before the Air Council formulated their proposals. They consider that during bombing practice there would be very real danger to any vessel even in the main channel. Recently, it is pointed out, the Harbour Board and the Southern Railway have spent several hundreds of pounds in extending and dredging the channel and the harbour, and they are therefore compelled to take every step to maintain a free and unhampered access to the harbour. Southampton is essentially a commercial port, and its development as such is in the national interest, the letter urges, and adds that in view of the present proposals the Board will have to consider the modification or complete withdrawal of the temporary permission given in 1920.

BIG INCREASE IN TONNAGE.

In this column last month reference was made to Board of Trade figures indicating the development of Southampton's shipping traffic and dock activity. The Board of Trade have now issued another set of comparative figures dealing with increases and decreases in the net tonnage of vessels arriving at and departing from ports of the United Kingdom during March, and these figures show that Southampton has every reason to be pleased with the progress made. Southampton is the only port which showed a six-figured increase under the tonnage heading. Compared with March of last year the net tonnage of vessels arriving at the port with cargo represented an increase of 108,000 tons during the month, this being an increase of 26.9 per cent.

Plymouth came second with an excess of 72,000 tons, representing a slightly better percentage increase than that of Southampton. There was also a substantial increase in the departures from Southampton with cargo, though in this connection the port did not hold the leading position. The Southampton sailings with cargo showed an advance of 47,000 net tons, representing a 9.5 per cent. improvement. The Southampton Dock statistics for April, issued by the Southern Railway Company, reveal that the number of vessels using the port advanced from 259 to 271 inward, and from 261 to 262 outward. The inward gross tonnage moved from 1,289,101 tons to 1,432,192 tons, while the outward figure was 1,433,533 tons compared with 1,319,952 tons in April, 1927. The inward net tonnage rose from 680,667 tons in April, 1927, to 774,912 tons, whilst the outward total increased from 695,671 tons to 773,168 tons. Inward cargo rose from 52,679 tons to 56,502 tons. Tonnage of outward cargo showed a reduction. In the passenger figures an increase of 3,468 inward is recorded, but a decrease of 5,734 outward.

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